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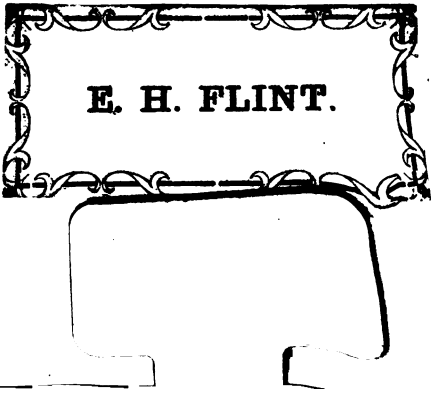

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OF

RURAL AFFAIRS,

FOR

1855-6-7.

WITH 440 ENGRAVINGS.

VOL. I.

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LUTHER TUCKER & SON.
1873.

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RURAL AFFAIRS:

A PRACTICAL AND COPIOUSLY

ILLUSTRATED REGISTER

OF

RURAL ECONOMY AND RURAL TASTE,

INCLUDING

COUNTRY DWELLINGS, IMPROVING AND PLANTING GROUNDS, FRUITS AND FLOWERS, DOMESTIC ANIMALS,

AND ALL

FARM AND GARDEN PROCESSES.

By J. J. THOMAS,

AUTHOR OF THE "AMERICAN FRUIT CULTURIST," AND "FARM IMPLEMENTS"
ASSOCIATE EDITOR OF THE "COUNTRY GENTLEMAN" AND "CULTIVATOR."

VOL. I.

FOUR HUNDRED AND FORTY ENGRAVINGS.

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PREFACE.

The present volume is composed of matter, which, in the form of an "Annual Register," has met with such general favor, and so wide a circulation, during the past three years, that the publishers have concluded to issue it in this more convenient and permanent style, under the simple and comprehensive title of "Rural Affairs."

The work is not a compilation. Far the larger portion was written by the accomplished and tasteful author exclusively for its pages, and the remainder,—with the exception of a very few selections, all of which are accompanied by due credit,—is mainly from his previous writings.

While the volume is thus an *original* one, in the strictest sense of the word, its contents cover a wide and interesting field. The construction and arrangement of Farm Buildings—including the Homestead—so as to secure their greatest comfort and convenience, and at the same time throw an air of simple beauty about the whole; suggestions to assist in a picturesque or graceful disposition of the grounds, to awaken an interest in Flowers and Shrubs, and aid in their selection and management; directions of the most intelligible and reliable kind in relation to the planting and care of Orchards, the smaller fruits and kitchen vegetables; the advantages and principles of good Implements, the importance and benefits of the best Stock,—of draining, rotation, and systematic and thorough Farming—in fine, Rural Economy in all its processes, Rural Taste in all its branches, are included in the design; and it has been the endeavor of the Author to treat them as plainly and concisely as possible, while no expense has been spared on the part of the Publishers, in securing profuse and appropriate Illustrations.

The whole is embraced in a compass within the means of all; and while it is hoped that the hints presented may enable every farmer in some respects at least, to effect important improvements, it is believed that they will also prove serviceable to towns-people, with little, if any more than a village or city lot at their command, and that both the Engravings and the substance of the book will aid in increasing the profits

and the pleasures of Rural Life, and in rendering Rural Homes more comfortable, tasteful and attractive.

It may be added that the ANNUAL REGISTER OF RURAL AFFAIRS will continue to appear, as heretofore, toward the close of each year. Number Four for 1858 is now ready—containing One Hundred and Thirty Engravings, illustrating Articles on "A Complete Country Residence," Designs for Country Dwellings, Bee Keeping, Flower and Kitchen Gardening, Farm and Garden Structures, Improved Domestic Animals, &c. Price Twenty-five Cents, and in quantities to the trade, Agricultural Societies and others, on the most liberal terms. Address

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THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

COUNTRY DWELLINGS.

THERE are several reasons why more attention should be given to the best modes for the erection of dwellings. In the first place, more time of our lives is often spent in them than in all other places put together. Secondly, our comfort depends greatly on having them well fitted to our wants. Thirdly, a great deal of labor, especially of women, is saved by an economical arrangement of the more common rooms, and hundreds of miles in walking, in the aggregate, prevented annually, by a few feet of lessened distance between the principal points. Fourthly, the associations connected with HOME have a most important bearing on the character, and those associations should therefore be such as to inspire domestic feeling and a taste for the graceful and beautiful; and to young people especially, it is of the most vital importance that every impression of this kind should be strongly made and carefully cherished, by imparting something of grace and loveliness to their homes, where the social sympathies may exclude all attraction for the bitterness and strife, the danger and dissipation of a turbulent and immoral world.

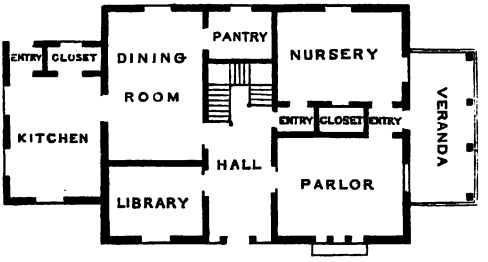
We purpose, therefore, to occupy a few pages with plans of improved dwellings, connected with some brief suggestions on the improvement and embellishment of the surrounding grounds, by planting and cultivation.

The first plan we present to our readers, is that of a country or farm house, of a neat, regular, and symmetrical form, with enough of a shade or cast towards the Italian style of architecture to remove all stiffness in its external appearance. (For perspective view see next page.) It is intended for a family of rather a cultivated or intellectual character, whose circumstances are such as to enable them to spend two thousand dollars or more in its erection. Without any attempt at costly ornament, it aims to give a tasteful exterior. A profusion of decoration, or "gingerbread work," so often seen, more commonly shows a want of true architectural taste than its presence. The simple elegance of a statue with the plainest drapery, is infinitely more pleasing than if covered with flashy ornaments, ribbons, poppies, and peacock's feathers; and more taste has been exhibited in the form and proportions

A SYMMETRICAL FARM-HOUSE.

of a log dwelling, than Horace Walpole evinced in his showy palace at Strawberry Hill, which was in fact but a glittering jumble of incongruous parts.

The plan needs but little explanation. The library may be devoted to books, papers, objects of natural history, optical instruments, &c., and would form an interesting resort for the younger members of the family, or for the pursuit of their home studies; or it might, under other circumstances, be occupied as a business office. The parlor and nursery both open on the veranda, through a small entry for the exclusion of the direct cold air in winter. If desired, the veranda may be replaced with two small bedrooms, for a larger or increasing family, and a small veranda be substituted in front of the hall, parlor, and library, extending about two-thirds the length of the three.



FIRST FLOOR.

The places for the chimneys are not shown in the plan. If a furnace is not used, stoves or fire-places may warm the nursery and parlor, by placing the chimney at the inner end of the closet between them; and the dining-room and library similarly warmed by means of a chimney in the partition which separates them. The kitchen may have a separate chimney, surmounted with one of Emerson's or Mott's ventilators, which will prevent smoking at all times, even if much lower than the roof adjoining.

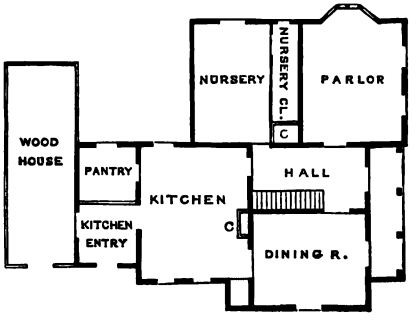
The plan of the second floor is not given, as it nearly resembles the plan below, affording five or six bed-rooms. Those who lodge hired men, may prefer a separate stairway, which may be entered from the kitchen, passing in a case up one side of the dining room, the space over which may be separately partitioned off for their use.

AN ITALIAN COUNTRY HOUSE.

The Italian style of building, characterized by its verandas, balconies, and projecting roofs, possesses several valuable qualities for country houses. It has more of an air of utility and adaptedness to the ordinary wants of American builders than the steep roofs and many angles of the Gothic style, while it has a freedom from stiffness and a grace of outline totally unlike the formal Grecian. The irregularity of form which it admits, enables the owner of an Italian dwelling at any time to add to it, if tastefully done, without at all injuring the architectural beauty of the whole. It is attended with none of the distortions of

ceilings, so common in the steep-roofed Gothic, nor none of the uncomfortably heated apartments so often found connected with those in close proximity to a roof, unless rafter ventilation has been carefully attended to.

We furnish above, an engraved view of a very convenient and moderate country house, possessing an Italian cast, perfectly simple in its structure, and entirely free from the campanile and other unnecessary decorations. The further roof seen in the view, only covers, by its double sides, the parlor; while the nursery has a lower and separate roof, hipped like that of the veranda. The annexed plan sufficiently explains itself, *c. c.* being the places for the chimneys, for the reception of the pipes of such stoves as may be needed—for these with proper ventilation, are quite as healthy as any other mode of heating, notwithstanding the frequent remarks of those who possess more poetry and imagination, than science and fact.



FIRST FLOOR.

In this plan, there are no receding angles, so subject to leakages when not made in the most careful manner. More architectural beauty, however, would be imparted to the interior, if the roof over the parlor were made like that of the higher part of the building, or with a *gable* front. But this would leave a *trough* next to the wall, which would require great care in rendering permanently water-tight.

In estimating the cost of such a house, very much will depend on the style of finish, and the size and height of the rooms, causing a variation from $1,500 to $3,000. If built as a plain and simple farm-house, depending mainly on neat and tasteful planting for its decoration, and with rooms only eight or nine feet high, it would scarcely exceed the former sum; but if the rooms are built eleven or twelve feet high, and in a more finished and substantial manner, it could not be done for less than $3,000, and the cost might easily be run up to four or five thousand.

Nothing has been more generally neglected by builders of dwellings, than ample provision for ventilation. Every part of the house should admit of a circulation of fresh air. The health of the inmates depends very greatly upon this precaution. The building itself will likewise last longer. For this purpose separate air flues should be placed in the walls when the house is built, for effecting the perfect ventilation of every cellar, room and closet. A register connected with each, would perfectly regulate the quantity of air admitted and passing out. This provision would contribute greatly to the healthiness of sleeping apartments, and to the comfort of rooms under a garret roof.

WORKING-MEN'S COTTAGES

While a great interest has been felt in the improvement of the better class of country dwellings, the cheaper farm houses and working-men's cottages, have been much neglected. Yet we venture the assertion, that more of the comfort and success of country living, and more of the prosperity of farming generally, depends on the erection of laborers' cottages, than on all other dwellings put together. This we propose to show.

In the first place, farming has been regarded to a great extent by those who judge merely from the outside appearance, as an inseparable bar to respectability. Foolish as this notion may seem, it has not been without its cause; and farmers themselves are in some measure to blame for it. They have not attended sufficiently to the cultivation of rural taste. They have not studied to make their homes pleasant and attractive by ornamental planting, gardening, fruit raising; by neat, well-furnished dwellings, amply provided with literary and scientific food—and too many who have aimed a notch higher than the rest, have rather sought for splendid emptiness, than compact and rural comfort. No wonder then, that farmers' sons so often turn away from what seems so dull and repulsive, and throng the "learned professions."

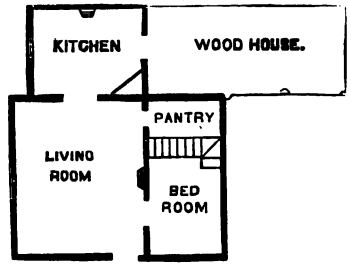
Another great drawback on the comforts and attractions of country life, is the incessant drudgery to which farmers' wives are generally subjected. The owner and occupant of a large farm must hire several men, and the farmer thinks it cheapest to board and lodge them in his family. There are a few "hired men" that are neat, respectable and intelligent; but the great mass care little for either cleanliness or mental culture. They throng the farm-house at noon and in the evenings, and often on the Sabbath, so that the wife and daughters have little or no seclusion for conversation, study, or writing, for it is next to impossible to prevent

in an ordinary farm-house a pretty thorough intermixture of individuals of all sorts and sizes. In addition to the inconvenience of this unwelcome occupance, there is still another of serious magnitude,—in the amount of drudgery they are compelled to perform in feeding so large and hungry a family. There are many farmers' wives and daughters, although amply provided with property, whose time is closely occupied from earliest dawn till long after dark, with a constant and laborious round of baking, boiling, stewing and roasting—and roasting, stewing, boiling and baking;—of washing, scrubbing, ironing, and an endless routine of other labors. It is no wonder, then, that we so often see country women bent down and furrowed with premature old age, while the merchants' and mechanics' wives, and the city resident, who are free from this grinding burden, remain at the same period of life, straight, vigorous, blooming and active. We have heard a most worthy and intelligent woman, who at fifty looked old enough for seventy, remark, that at a fair estimate she had cooked at least fifty tons of food for laboring men. This fully explains the reason that town ladies regard it as a sort of state prison punishment to marry young farmers.

Now, remove these two great evils,—the slavery of country women, —and the repulsive aspect of farming to young men, resulting mainly from this slavery,—and a striking revolution would be instantly made in th comfort, respectability, and success of farming. But how is this to be done? The mode is cheap obvious and simple,—merely by the erection of good laborers' cottages. We have tried this system for many years, and "we know whereof we affirm." Hire married men, who can board at home, and give the farmer's family the exclusive occupancy of their own house and table. Such men can board themselves more cheaply than another can do it, by purchasing just such articles as suits their wants and rules of economy, which are prepared at home at no cost. The farmer, by agreement, may furnish these supplies from his farm. "We cannot get such men as are worth a straw!" exclaims some one

who has only provided comfortless shanties for them, into which no smart decent man would thrust his family; but let neat, commodious and tasteful cottages be built, ornamented with a little door-yard shrubbery, or mantled with climbing roses and honeysuckles, and no difficulty will be found in getting men of the right stamp. Houses of this character may be built for *one hundred and fifty to two hundred dollars each*, and will be worth at least one thousand dollars to the man who places any proper estimate on the life and health of his wife.

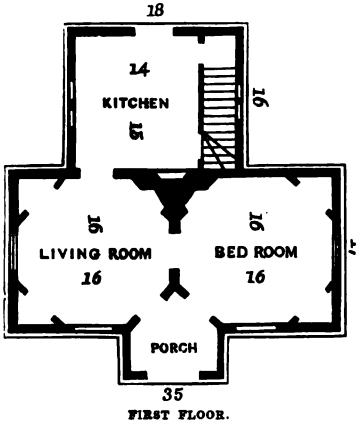
Accompanying this article, we furnish a plan and view (for view see page 26) of a cottage that may be built for two hundred dollars; and with small rooms and cheap materials, for considerably less. It is made simple, and with as few corners or angles as posssible, so as to make it cheap as well as good and free from leakages. Its covering is unplaned or rough plank, which is to receive two or three coats of lime-wash, softened or tinted with a little brown ochre. This if repeated every three or four years, will look nearly as well, and prove nearly as useful to the wood as oil paint. This we have proved by experience. The plan of the house explains itself. The size of the rooms may be suited to circumstances. A simple frame is erected, and vertical plank siding nailed upon it, each plank being of nearly equal width. An inch board or batten three inches wide, is closely nailed on each joint or crack, both outside and inside. The inner batten receives the lathing. This forms a good and close wall. An architectural appearance is given to the whole by brackets under the eaves, and by door caps and window hoods,—the whole not costing five dollars. To avoid a flimsy appearance, and give the house a substantial air, these brackets and caps should be made of plank *at least* two inches in thickness. By observing a tasteful exterior of this kind, a washed, unplaned house will look incomparably better than an awkwardly constructed building, plained and painted in the most costly manner. In addition to the living-room, kitchen, and bed-room below, there is in this plan space for two good bedrooms above. Such a house, with large rooms, and better finish, might be built for three hundred dollars, so as to accommodate the owner of a small, cheap farm. Laborers' cottages of more limited dimensions, suitable for very small families, might be erected in the manner described for a sum scarcely exceeding one hundred dollars, and still be more comfortable than three-fourths of the buildings now occupied for similar purposes.



FIRST FLOOR.

A CHEAP FARM-HOUSE.

The accompanying design was first published in the Horticulturist It has a more ornamental appearance than the preceding, the style of its architecture being decidedly of an Italian cast. It is built like that, with vertical boarding, and is intended to be painted and sanded on the rough surface.



FIRST FLOOR.

The plan is good and compact. The chimney being in the middle, less heat is lost in winter. For a large family some would prefer making two bedrooms of the one below, although there are now four good ones above. Such a house of similar material, would cost about double the preceding. Painted and with substantial finish, it might be built for about *five hundred dollars*. Its only defect is the angle in the roof, rendering leakage more liable than with a straight surface.

Vertical boarding has several advantages. It is cheap—affords tight walls—is free from decay by the lodgment of water—and accords well with the simple bracketed eaves. Many do not like it simply because they are not accustomed to it, and a certain agricultural editor has uttered his strong dislike by the characteristic expression, "It is very mean looking,"—by which he evidently meant that he had a strong prejudice against it, without any definite reason. True taste depends very much on utility with neatness combined—both of which this mode of building eminently possesses

IMPROVING OLD HOUSES.

"There is certainly nothing," observes a late writer, "that more powerfully affects the tastes and habits of a family—especially the younger members—than the house in which it lives. An uncouth, squallid habitation, is little likely to awaken that attachment to home, that love of good order, and that sense of propriety and elegance in social deportment, which are so much promoted, so much developed, by that home where a certain proportion, a certain fitness and a sense of beauty, is every where visible. It is not necessary to these conditions that wealth should always be present;—a log hut may, in its way, be made as tasteful as a palace. *Only it is needful that the mind should be alive to the superiority of a good form over a bad one*—that we should be susceptible of the enjoyment of beauty, whether in the rainbow, the sunshine, smiling fields, or rural cottages and gardens, at least as constantly and strongly as we feel the mere animal pleasures of eating and drinking, sleeping and walking."

We have already shown the importance of good, convenient and pleasant homes, and their influence on the character of a rising family; but it very often happens that the country resident already possesses a house, which he has bought, inherited or thoughtlessly built, which has no pleasing expression to recommend it. Such a house may often be *altered*, with one fourth of the expense of erecting a new one, so as to exhibit nearly all that is desired. Some times a very little change in external form will greatly alter the architectural expression.

A good deal of taste and reflection, and some of architectural knowledge, are required in planning these alterations. We often see houses repaired and remoddled, that are made to appear worse than before,—and here we allude more particularly to the alteration of simple, plain houses, into heavy, awkward attempts at Grecian imitations—a style of architecture extremely difficult to introduce into rural dwellings, without wholly destroying that cheerful, hospitable expression which they should always possess. We would advise that such alterations should in all cases aim to give an Italian or Gothic cast to the appearance—or their intermediate, the Bracketed manner, which has been sometimes termed the American style, but which is nevertheless of European origin. The Italian is marked more particularly by its flatter roofs and broad eaves, its verandas and balconies, the latter to be very sparingly introduced into all unpretending erections. Buildings whose roofs are more nearly horizontal, and whose forms are irregular, may with most propriety, be altered to aproach this style in character. The Gothic is more particularly characterized by its steep roofs and pointed gables; and consequently is fitted to alterations of more steep-roofed dwellings. The very common errors should however be avoided, of covering Gothic houses with a profusion of attempted ornament, or "carved paste-board" work, destroying the simple, neat and substantial expression which should always be conspicuous; and the not less common error of giving to them too many gables, or of making the roofs too steep and the eaves too low, reminding one at once of nothing else but a very long extinguisher on a very short candle.

As an example of a successful attempt, of the kind we speak of, we give the two accompanying figures, from the first volume of the Horti-

culturist, the first representing a plain, common-place dwelling; and the second the same with the proposed improvements. We quote at length the description of the details:

"In the first place, to give spirit and character to it, we have boldly projected the roof, and ornamented the eaves. To give expression to the tame line of roof we have added a small gable in front. The window pierced in this gable, will serve to light and render useful an additional room in the garret. For the meagre and insufficient porch, we have substituted a veranda ten feet wide, along the whole front; the shade and comfort of which in summer, makes it at least equal in value to any room in the house.

A part of the roof of this veranda, viz: that portion under the shadow of the gable, is finished with a tight sealed floor, so as to form an agreeable balcony to the central window of the front. The windows themselves, (though this is not so important,) we should prefer to change from the common form, to that of the more expressive and cottage-like *latticed sash*, as shown in the engraving.

We think no one can compare these two buildings without confessing that the alteration confers a character of taste and picturesqueness on what was before a very ordinary and insipid building. The improvement does not involve any material change in the body of the house itself, but merely in those external parts easily altered and added to.

Let us add a few words on the details themselves, that we may be the better understood. The roof should project two and a half feet all

round the house. This projection is easily made by taking off the siding directly under the eaves of the old roof—introducing pieces of joists as rafters; upon which carry out the rafter boarding, and piece out the roof to the necessary breadth.

The verge boards, or eave boards, (i. e. the ornamental piece running round below the outer edge of the roof,) must be cut out of sound *two inch* plank. It is the besetting architectural sin of half the carpenters in the country, (and more especially those in New-England,) to make these portions of a rural cottage of *thin boards*. Nothing gives a cottage, otherwise good, such a rickety, *paste-board-ish* air. The spirit of the carvings and ornaments of the Gothic villa, of which these cotages are modified forms, is that of elegant solidity—not "*ginger-bread*" flimsiness.

The supports of the veranda are simple solid posts or columns, six or eight inches in diameter, left square for base and capital, and hewn to an octagon in the shaft. The arch which runs at the top, from one to the other, is cut from two inch plank.

Nothing is heavier and less agreeable than the common square chimney. We would therefore advise the owner to complete the alteration by adopting the simple form of carrying up distinct flues, standing on a common base, and connected at the top, as we have shown. The expense is but little more than in the common mode, and the effect far lighter and more agreeable."

IMPROVING AND PLANTING GROUNDS.

No dwelling, however tastefully built, can ever give a complete expression of comfort, without the presence of TREES. And on the other hand, a house even positively defective and uncouth, may be astonishingly improved in general appearance by the right kind of planting. Its disproportions may be partly hid by foliage, and an air of seclusion, and of positive beauty imparted to the surroundings by neatly kept grounds and well disposed groupings of trees. And what renders this kind of natural ornament of more general usefulness, is its *cheapness*. Highly wrought architectural decorations can be only had by the rich; the infinitely more pleasing decoration of foliage, furnished by ornamental trees and shrubs, and rustic structures covered with the drapery of climbers, is perfectly within the means of the poorest cottager.

A gentleman of our acquaintance, built a fine house costing three thousand dollars. When he was subsequently occupied in laying out and planting the grounds, we ventured to suggest to him the propriety of setting out fifty or a hundred ornamental trees and shrubs, properly disposed around his dwelling. "O, he could not *afford* it!" His grounds must be wholly planted with *fruit trees*, all in rows, and his front yard occupied with beds of beets and onions and of garden vegetables generally. Now, there is nothing more pleasant than an abundant supply of fine fruit, and of the best vegetables; but the glaring inconsistency was the expenditure of five hundred dollars to give an ostentatious finish to the house, and then refusing to expend fifty in planting the immediate environs in a manner according somewhat with the architectural display. A retrenchment of one-sixth of the cost (or $500,) would scarcely have affected the appearance or comfort of the dwelling; while one-tenth (or $50,) in judicious planting would almost have made a little paradise around it, and contributed more to an air of respectability, beauty and comfort, than any amount of architecture alone. This is not a solitary case—nothing is more common than profuse expenditure in building, and the most meager outlay, or no outlay at all, for beautifying the grounds. Nothing could be more completely wrong-end-foremost than this course; for the simplest cottage tastefully furnished with the drapery of foliage, is incomparably more agreeable to the eye, than a stately and costly mansion with only a cornfield at one door, and a potato patch at the other.

In giving a few plans for laying out door-yards and ornamental grounds in the immediate vicinity of a country or village residence, it is taken for granted that the soil has been amply prepared by subsoiling or trenching, and by a copious application and intermixture of manure—for without such preparation, the trees and shrubs will grow slowly, will be long in affording the desired shade, and will never exhibit half the beauty of appearance that is imparted by rapid and luxuriant growth.

The simplest grounds for the exercise of taste in planting, are those of the village residence where a space of only a few yards intervene between the dwelling and the boundaries. But here one great advantage exists—the narrow dimensions enable the occupant to preserve the most finished appearance, as he has but little space over which to extend his labors. The turf may be kept shaven, like velvet—trees and shrubs may be

carefully trained in the most graceful or symmetrical forms—and gravel walks may rival in smoothness a plank floor. In laying out the walks much care and judgment are requisite. A strai't walk from the entrancegate to the first door always has an air of stiffness, unless the yard is very narrow, and this stiffness is relieved by side walks, curved and arranged as in plan, fig. 1, which is a very good one for grounds of this character, one of the side walks leading to the kitchen entrance, and the other to the garden in the rear—the former may have a separate gate-entrance, closely planted so as to be inconspicuous, as shown on the right corner of the figure. A modification of this plan (fig. 2) reduces what little stiffness there may be in the straight walk by introducing curved outlines thro'out. Where a greater breadth of ground exists, it maybe laid out as in the annexed plan, (fig. 8,) in which the principal entrance walk, without the inconvenient and unnatural curve so often seen, deviates enough from the right line to destroy all unpleasant appearance of formality. The smaller curved walko n the right affords a convenient entrance to the kitchen.

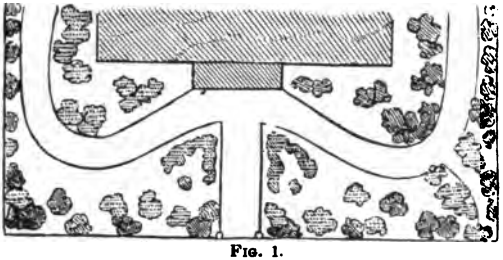


FIG. 1.

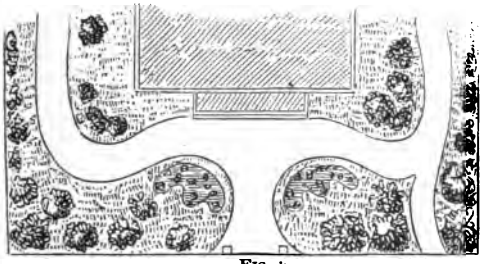


FIG. 2.

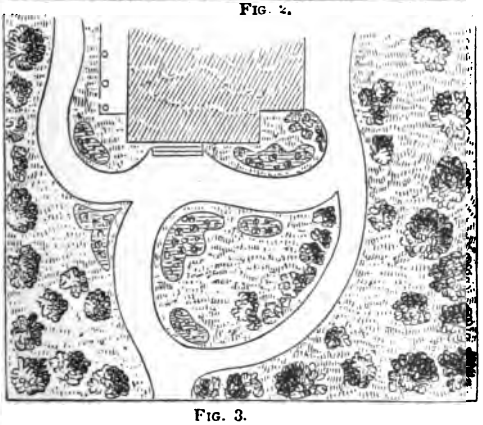


FIG. 3.

In these plans, the ornamental effect of the grounds is increased by the introduction of a few flower beds, nearest the walk and dwelling, cut into the turf as shown in the two last figures. These beds if neatly kept, and furnished with the most brilliant, successively-flowering plants, and surrounded with a velvet turf, will wholly avoid the bad appearance so often given to front grounds, by cutting up the whole surface into beds for flowers. At the same time the labor of keeping a given surface in the best order is much diminished, for the turf which constitutes the greatest part of the surface in the third plan, is quickly passed over once a week with a lawn-scythe.

In selecting the plants for these beds, we can only say in general terms that those should be chosen which appear well the whole summer, whether in blossom or not; but that if possible a constant succession of flowers should be furnished throughout the season. By commencing with the early-flowering bulbs, following these with the best herbaceous perennials, and closing with the finest annuals, a good succession may be kept up; and if in addition to these, some of the most brilliant green-house plants can be had, with gladioluses, tiger-flowers, and other summer and autumn-flowering bulbs, the result will be highly satisfactory.

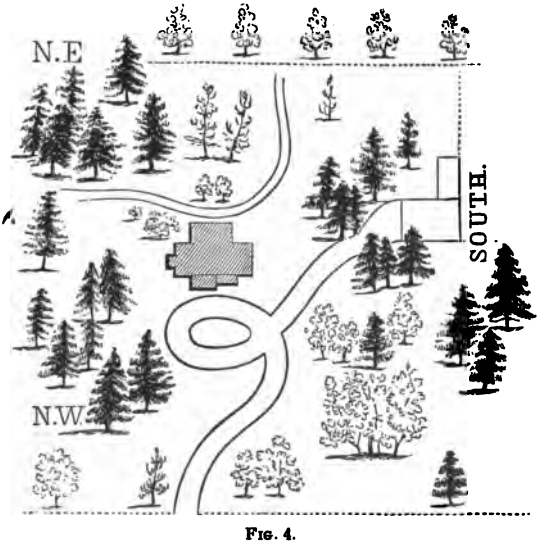


FIG. 4.

Where an acre or more may be devoted to ornamental planting in the immediate vicinity of the dwelling, the carriage drive takes the place of the foot-walk, as in the above design, (fig. 4,) where an elliptical form is given to it in front of the house, for turning, after which it passes to the carriage-house which is densely flanked and nearly concealed with evergreen trees. This plan is also intended to exhibit the protection

which a proper disposition of evergreens may afford in winter, from the cold prevailing winds, which in this instance are supposed to blow from the north-east, north-west and south, the groupings on these three points being most dense.

It will be seen that in this plan and in those already given, the modern, graceful and irregular mode of planting is adopted, equally avoiding any thing like the stiffness of rows, the formality of distinct clumps, or the confused appearance of indiscriminately scattered trees. This mode of arranging trees will be more fully explained on a subsequent page.

FLOWER GARDENS.

We have already remarked on the economy of labor, where flower beds are cut into smooth turf, instead of occupying the whole surface. This gives a great advantage to all gardens arranged in the natural and graceful style, instead of the more common mode of stiff, regular geometric figures. The accompanying plan (fig. 1) represents a garden of this sort, which is supposed to be situated in the rear of the dwelling *a*,

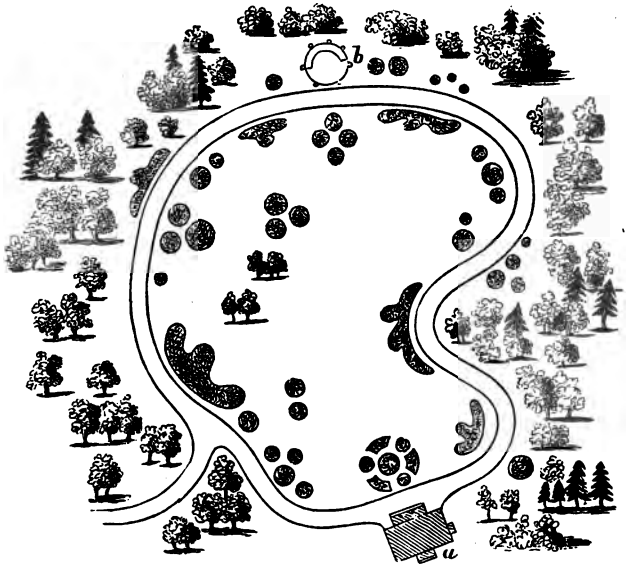


FIG. 1.

on a nearly level, smooth, closely-shaven lawn—the parallel lines indicating the walk, which passes round the whole, and the circles and ir-

regular figures within represent the flower-beds. It will be observed here that the trees are so disposed as to surround the whole and form a sort of amphitheatre, the view from the house across the flower garden, and to the summer house *b*, being nearly unobstructed, and rendering most of it visible at one view At the same time, the outline should be somewhat broken, in order that a portion may appear to be hidden, which adds both to the variety and apparent extent of the grounds.

It will be observed in this plan, that wherever there are any abrupt curves, beds of flowers or shrubbery are placed at those points, so as to

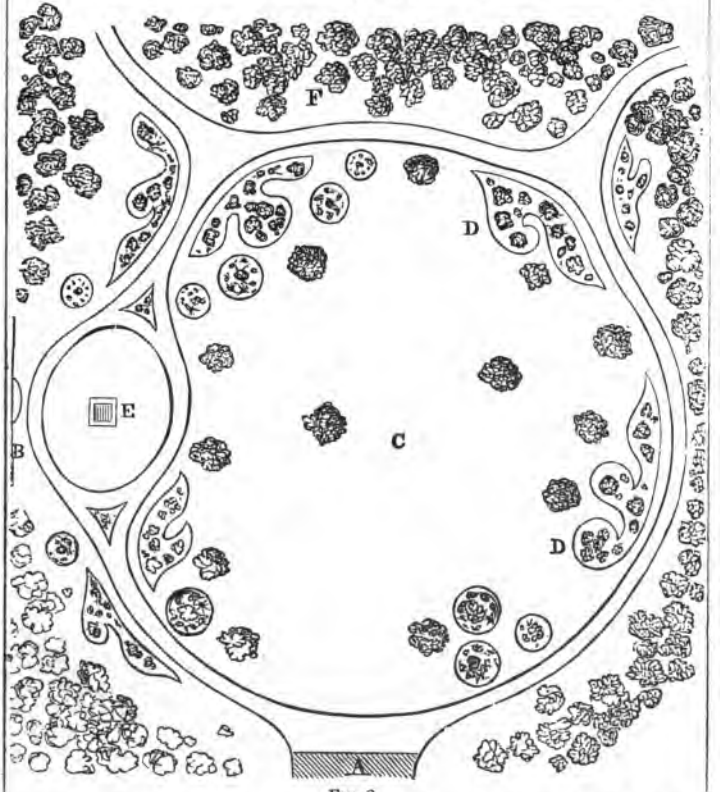


FIG. 2.

give a sufficient reason for the deviations at those places—for it is only irksome to be compelled to pass round a needless curve, or one which does not exhibit some interesting view or object. The flower-beds and shrub-

bery should also be sufficient to conceal such portions of the walk as are remote from the spectator, who should see only that portion immediately before him. The continued curve to the right or left as he advances, affords a constantly varying scene and a pleasing succession of views.

A more irregular and picturesque plan is exhibited by fig. 2, (see preceding page) the boundary trees constituting irregularly disposed masses. A, is the dwelling house; B the green house or conservatory; C the lawn; D, flower-beds; and E a sun dial, fountain, or rustic basket of flowers.

GEOMETRIC AND NATURAL PLANTING.

Two very distinct styles of arranging and planting ornamental grounds have been adopted. In the old-fashioned or *geometric* style, every thing was arranged in straight lines or occasional circles. Every care was taken, in this style, to avoid any thing like irregularity. A tree on one side of the house was opposed by another ***vis a vis;*** a row on the right had an accompanying row on the left; or as Pope satirically expressed it,

> Grove nods to grove, each alley has its brother,
> And half the platform just reflects the other;"

and the old gardener of the Earl of Selkirk, who was very strongly imbued with this mania, when he shut up the thief in the summer house for stealing the fruit, was compelled for the sake of symmetry to confine his own son in the summer house opposite. How exceedingly more

pleasing, is the simple imitation of the beautiful and picturesque in nature, which constitutes essentially the modern or NATURAL style.

It is not an unfrequent error to suppose that the modern style consists *merely* in *irregularity*. But irregularity without arrangement, is not

taste—confusion is not the beautiful in nature. The *perfection* of art consists in producing a pleasing effect, while the art which produced it, is concealed from the eye of the spectator. The scenery which artificial planting produces, may *appear* to be the accidental arrangement of agreeable parts or objects; but it must really be the result of close study and a careful eye,—in the same way that the roughly dashed work of a skillful painter, where every touch, rude and accidental as it may seem at first glance, is found on taking the whole together, to produce a most perfect and complete combination of different parts. And one great excellence of the modern style consists in its complete adaptation to all grades of residences—it does not require costly embellishments, nor a profuse outlay—the cottage resident may show as much skill in a *tasteful simplicity*, as the owner of the magnificent park in the disposition of his broad lawns and majestic forest trees.

In order to produce the best effect in grouping trees, these requisites are essential,—*unity*, *harmony* and *variety*. As an example in illustration,—the scene represented in the preceding engraving, representing a natural group of elms, possesses every thing agreeable but *variety*—and it possesses much of this quality so far as the arrangement of the trees is concerned, but it lacks variety from the trees being all of one kind. For this reason the following example is free from objection. We can

give no better practical rules on this subject than the following from A. J. Downing:

"The only rules which we can suggest to govern the planter are these: First, if a certain leading expression is desired in a group of trees, together with as great a variety as possible, such species must be chosen as harmonize with each other in certain leading points. And, secondly, in occasionally intermingling trees of opposite characters, discordance may be prevented, and harmonious expression promoted, by interposing other trees of an intermediate character.

"In the first case, suppose it is desired to form a group of trees, in which gracefulness must be the leading expression. The willow alone would have the effect; but in groups, willows alone produce sameness; in order, therefore, to give variety, we must choose other trees which, while they differ from the willow in some particulars, agree in others. The elm has much larger and darker foliage, while it has also a drooping spray; the weeping birch differs in its leaves, but agrees in the pensile flow of its branches; the common birch has few pendant boughs, but resembles in the airy lightness of its leaves; and the three-thorned acacia, though its branches are horizontal, has delicate foliage of nearly the same hue and floating lightness as the willow. Here we have a group of five trees, which is, in the whole full of gracefulness and variety,

while there is nothing in the composition inharmonious to the practiced eye.

"To illustrate the second case, let us suppose a long sweeping outline of maples, birches, and other light, mellow-colored trees, which the improver wishes to vary, and break into groups, by spiry-topped, evergreen trees. It is evident, that if these trees were planted in such a manner as to peer abruptly out of the light colored foliage of the former trees, in dark, or almost black masses of tapering verdure, the effect would be by no means so satisfactory and pleasing, as if there were a partial transition from the mellow, pale green of the maples, etc., to the dark hues of the oak, ash, or beech, and finally the sombre tint of the evergreens. Thus much for the coloring; and if, in addition to this, oblong headed trees, or pyramidal trees, were also placed near and partly intermingled with the spiry-topped ones, the unity of the whole composition would be still more complete.

"Contrasts, again, are often admissible in woody scenery, and we would not wish to lose many of our most superb trees, because they could not be introduced in particular portions of landscape. Contrasts in trees may be so violent as to be displeasing; as in the example of the groups of the three trees, the willow, poplar and oak; or they may be such as to produce spirited and pleasing effects. This must be effected by planting the different divisions of trees, first, in small, leading groups, and then by effecting a union between the groups of different character, by intermingling those of the nearest similarity into and near the groups: in this way, by easy transitions from the drooping to the round-headed, and from these to the tapering trees, the whole of the foliage and forms, harmonize well."

FORM OF TREES.

What an endless intermixture of beauty, and intricacy, and richness, and gracefulness, every where exists in the form and foliage of luxuriant trees! Prof. Wilson, who was their enthusiastic admirer, exclaimed, "In what one imaginable attribute, that it ought to possess, is a tree, pray, deficient? Light, shade, shelter, coolness, freshness, music —all the colors of the rainbow, dew and dreams dropping through their umbrageous twilight at eve and morn—the grove, the coppice, the wood, the forest—dearly, and after a different fashion, do we love you all! And love you all we shall, while our dim eyes can catch the glimmer, our dull ears the murmur of the leaves—or our imagination hear at midnight the far-off swaying of old branches groaning in the tempest." Trees are nature's universal drapery, more beautiful in form and color, than the imagination of all the poets that ever lived could have pictured, had they a world without them,—an African desert, "a wild expanse of lifeless sand and sky,"—to clothe with refreshment and verdure

Every one has heard of the boy who "could not see the town there were so many houses," and it is only in a similar way that we can account for the total want of appreciation for these most beautiful objects of nature, so commonly prevalent. Blessings may be so profusely showered down, as not to be at all felt; and hence perhaps the

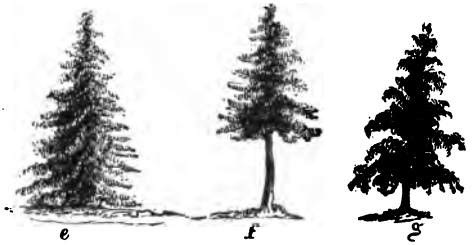
reason of the animosity with which every fragment of our wild, rich, natural plantations are assailed by the new settler; till nothing is left to shelter the newly erected dwelling from the burning, bleaching sun;—and hence also the reason that many of our older homes, which ought now to be richly embellished with these delightful and perfect rural adornments, are repulsive from their bleakness, exposed as they are to the torrid reflection of dog-days, and the drifting snows and whistling winds of mid-winter. We hope a portion of the world is learning better—and we are sure that no one has to do more than to open his eyes and see the grace and grandeur of trees, to say nothing of the real, substantial comfort which may be derived from them, in order to spare them from the axe, and to plant, cultivate and admire them.

But our object at present is not so much to eulogize trees, as to point

out the mode by which their graceful proportions may be best preserved, as well as to show how they are greatly injured in appearance by improper treatment.

No one who ever compared the rich, rolling masses of verdure in luxuriant trees, to the rounded volumes of dense clouds, would be guilty of the *artificial distortions* sometimes given them in the shape of high trimming. Contrast, for example, the full-headed trees on the left of the figure on p. 40, with the meagre specimens on the right. The first are fine, fully developed forms, their lower branches nearly sweep-

ing the ground, and on a lawn would present an incomparably better appearance, than the tufted poles represented on the right, which show a mode of trimming, which some adopt, only because they have seen others do it. Or, take as another example, the fine old English beech, represented at the head of page 40, and imagine its appearance if its boughs were lopped off half way up to the summit. Still more meagre is the appearance sometimes given to *evergreen* trees, an example of which is afforded in *f*, in the above figure, as contrasted with *e* in the same figure.



A very fine example of the characteristic form of growth which we here recommend, is furnished by the figure on page 41, it being an actual portrait of a Norway spruce of uncommonly fine and drooping habit of growth. Naked stems would most obviously destroy nearly all the grace and beauty possessed by these fine trees.

SUPPORTS FOR CLIMBERS.

Vines and climbing plants may form objects of peculiar interest in the grounds of every rural home, if judiciously introduced. Where the house partakes of the character of a cottage, a beautiful effect may be produced by enwreathing its doors or windows, or mantling its walls with their growth, provided those walls are built of such durable materials as brick or stone. Buildings of wood are much injured and their decay hastened by immediate contact with any kind of foliage. Some persons will likewise object to climbers in contact with the house, from the insects they are apt to introduce.

But no objection can be made to separate supports, in the form of pillars and pyramids. As these, however, are more picturesque and irregular in their forms, they should not be placed in front of the house, nor in the more formal and finished parts of the ground, but in such as approach a little more to wildness of character. The simplest of these supports is the single upright pillar, which may consist of cedar or other durable wood in its rough bark, or of a sawed piece of timber, A fig. 1. Holes are bored through at regular intervals, through which the leading shoots are inserted as they advance upward in growth, passing them in opposite directions through the same hole, and at the same time occasionally twining them around the post, so as to conceal its surface. This mode of support is not adapted to delicate climbers, which have not much breadth of foliage, but for prairie roses, bignonias, and other strong climbers, it is admirably suited, as they soon cover the whole surface with a little management, as in B, fig. 1. Nothing can have a finer

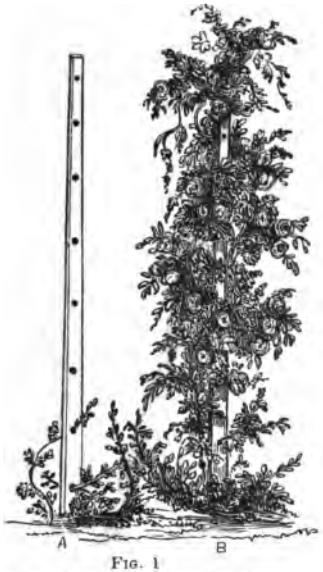


FIG. 1

effect than when two climbing roses of unlike colors, as for example, the Prairie Queen and Baltimore Belle, are both trained on the same pillar, the intermixture of the flowers white and red, in such profusion as these two sorts furnish, presenting a most brilliant exhibition. The height of these columns should not be less than nine or ten feet, which will require the entire length of the post to be twelve or thirteen feet. Strong wooden rods or pegs driven through the holes may sometimes be preferred for upholding the climber.

FIG. 2.

A more picturesque and irregular pillar of verdure is made by simply procuring a small cedar tree, ten or fifteen feet high, shortening in all the side branches to within a foot and a half of the trunk at bottom, and still shorter towards the top, and then setting it like a post two or three feet into the ground. Any rampant climbers will soon cover this from top to bottom, and form a firm pyramid of verdure, fig. 2. The bark should by all means be left on this support, and the error avoided which we sometimes see, of carefully shaving it all off and painting the whole,

which is much like the man who painted his very neat wood pile, or the one who whitewashed his imitation rock-work.

Supports for slender climbers, (as for example the cypress-vine and morning-glory,) which are but partially covered, may be more finished and artificial in form. They should be made of the most durable wood,

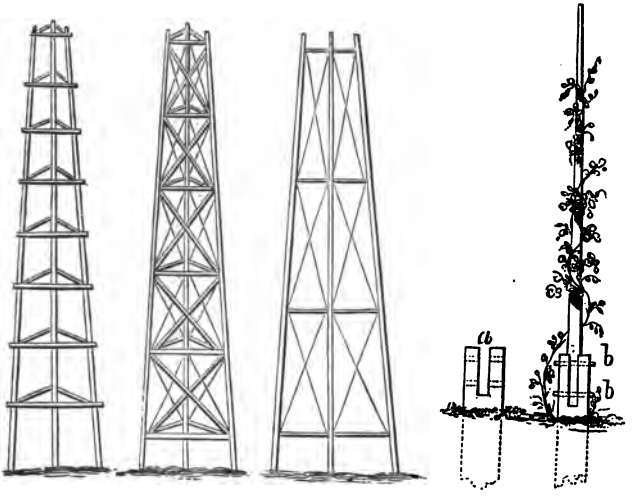


Fig. 3. Fig. 4. Fig. 5. Fig. 6.

and may be painted green or white. Fig. 8 represents a very simple form, as often constructed; an improvement is made by fastening the connecting strips in such a manner as firmly to brace the whole together, and at the same time to add to the appearance, which is of some consequence while the frame is yet but partly covered, figs. 4 and 5. Fig. 5 repesents only one of the three sides of the frame.

A difficulty sometimes occurs where the climber is tender, and needs covering in winter, as with Bignonia grandiflora, tender roses, &c. This is obviated by means of the contrivance represented in figures 6 and 7, which admits of the prostration of the support with all its load, every autumn, for easy covering on the surface of the ground. A short substantial post of red cedar, projecting a foot above the surface, receives the support in an opening or slit, being kept upright by two pins. *b*, *b*, fig. 6. On the approach of winter the upper pin is withdrawn, and the support laid flat upon the ground for covering, fig. 7.

Fig. 7.

THE CULTURE OF FRUIT.

The extension of three great improvements mark the past ten years as a remarkable era—Railways, Telegraphs and Fruit-trees. The benefits conferred by the latter to the people at large, are quite equal to those of the two first combined. Nothing has occurred in the history of mankind to compare at all with the extent of fruit gardens and orchards that are yearly set out. Fifteen years ago, we visited at Rochester what is now the largest nursery in America—it consisted of only six acres of ground. The same proprietors now occupy two hundred acres densely planted with thrifty fruit trees, and their sales are fully equal to their propagation. Fifteen years ago, the whole ground in fruit nurseries, within ten miles of Rochester, did not amount to fifty acres; now, a careful estimate gives the amount at least one thousand acres. And all these are yearly pouring their millions of trees into all parts of the country, and yet the demand for them to set out is quite equal to the supply.

Fifteen years ago, we were repeatedly told that "so many large nurseries" would glut the market for trees—and that the market for fruit would be likewise deluged and overdone. Time has now elapsed sufficient to bring those trees, with good culture, into full bearing; and the yearly amount set out since that prediction, has increased ten-fold · yet the price of good fruit at this day is higher than ever.

There is a reason for all this. One is the discovered value of fine fruit, and the other is the loss of myriads of young trees by bad management. On these two points, we propose to offer a few remarks.

First,—on the value of fruit, but few words will be needed, for the whole community are quickly discovering that a few acres of orchard often yield more profit than all the rest of a large farm—that one to three hundred dollars per acre annually is no unusual return under good management—while in rare cases, a single tree will nearly pay for an acre of ground by the products of one season only. Besides this, not a few are learning that a good supply for family use saves a great many hard-earned dollars, yearly paid to the miller or butcher, or what is the

same thing, an equal amount turned into market. The use of apples alone, where a constant supply may be had for baking, stewing, for puddings, and for pies, would save to many families at least an hundred dollars annually—and by using rich, high-flavored sorts, the use of hundreds of pounds of sugar would be obviated, otherwise required for sweetening and supplying the requisite flavor. But this is so well understood that we need not dwell upon the subject longer, except merely to allude to the pleasure and satisfaction which it must afford every one to be furnished with a succession of delicious fruits during a great part of the year, commencing with strawberries, and including cherries, currants, raspberries, apricots, pears, plums, peaches, and apples, some of which may with care, be had for use during every day of the year.

In relation to MANAGEMENT, a great deal may be profitably said. The ground for every orchard and fruit garden, should, in the first place, be properly enriched; secondly, the trees should be well set out; and thirdly, and most important of all, good and constant cultivation must be given. There is no "royal road" to good fruit; an orchard requires attention and labor quite as much as a field of corn and potatoes. The most efficient and economical way to perform this labor it is our present object to point out.

PREPARATION OF THE SOIL.

Two modes are adopted for preparing the soil for fruit trees. One is to reduce the *whole surface* to a high degree of fertility by deep plowing or trenching and manuring, and the other is to dig large holes and fill them with rich compost mixed with the returned soil. Each of these modes has its advantages. In fruit gardens, proper, where trees of quick and rather small growth are set as near each other as circumstances will admit, it may be best to prepare at once the whole surface; but for extensive apple orchards, where a distance of 30 or 40 feet intervenes between the trees, and when many years must elapse before they cover the whole surface, it may be sufficient to enrich at first the soil in the immediate vicinity of each tree.

The most perfect way for preparing the entire surface of the soil is trenching by hand to a depth of two and a half to three feet, working in manure at the same time. But as this mode is only fitted for very small portions of ground, larger may be well prepared by means of the subsoil and trench plow. The soil may be loosened in the first place to a depth of twenty inches by a large subsoil plow drawn by a strong team. After being thus loosened, a double Michigan plow will invert it to any desired depth, and assist in the intermixture of large quantities of manure, which should be as finely broken with the harrow as practicable before turning under. Thus, by a combined use of the subsoil and trench plow, and by a free use of the harrow, a deep, rich, and mellow bed of earth may be formed for the reception of the trees.

DRAG ROLLER.

Well-rotted manure or compost is best if the trees are to be planted immediately, but fresh manure will answer provided it is torn to pieces,

finely pulverized, and thoroughly intermixed with the soil by repeated harrowings. On clayey ground, nothing is better for this purpose than the simple instrument known as the "drag-roller."

In ordinary cases it may be sufficient to dig holes in this mellow bed of deep soil, only large enough to receive the roots of trees without crowding; but where a very rapid growth is desired during the first years after transplanting, large holes, several feet in diameter, are to be dug and filled with richer materials.

When the whole surface cannot be prepared in this manner, large holes should be dug, and filled with rotted manure and earth, intimately intermixed. No fresh manure should ever be allowed to come in contact with the roots; but if well incorporated with the soil, it may be placed in the outer part of the large holes for the roots to penetrate as they extend their growth. By preparing holes in this way seven or eight feet in diameter, we have found the young trees to make a growth for the first four years at least triple that of trees set in common good soil with holes just large enough to receive the roots.

In setting out large apple orchards, it may not be practicable to subsoil or trench the entire ground. Large holes may be dug as just described, or a strip of ground for each row eight feet wide, may be prepared by subsoiling and manuring, taking care in all cases that the manure is well pulverized and incorporated by repeated harrowings. This mode is particularly adapted to clayey grounds, the furrow which is made at each row operating as a drain to carry off the water which would otherwise settle and freeze in winter about the roots. For this reason it will be important to place the rows in a descending direction; and the drainage will be facilitated by laying a little brush in the bottom of the "dead furrow," before it is filled with the plow, along which the surplus water will soak away.

DRAINING.

The assistance to drainage we have just spoken of, must not be understood as superseding the necessity of thorough underdraining. There are very few soils which would not be greatly benefitted by it, and to many, even those supposed to be dry enough, it is absolutely necessary. Many thousand young trees are yearly lost in consequence of setting them in ground that retains more or less stagnant water, although dry on the surface; and many thousand bearing trees become stunted, mossy, and yield scrubby fruit from the same cause,

DISTANCES, AND LAYING OUT THE GROUND.

In laying out ground for transplanting, it is absolutely necessary to know the proper distances for each sort. If too remote from each other, a waste of land is the result; if too near, they crowd each other, and prevent the growth and ripening of the fruit to the best advantage. The following rules on this subject, which are as nearly correct as may be given for general application to different varieties and soils, are copied from a late edition of the American Fruit Culturist.

"Apples.—In fertile districts of the country, where the trees may attain great size, and where there is plenty of land, 40 feet is the greatest distance required. The usual distance is two rods or 33 feet. Where the most is to be made of the land, and where thinning-in the limbs is

practiced when the trees become too large, 25 feet distance may be adopted. For pyramids on apple stocks, 10 feet; for pyramids or dwarf standards on Doucain stocks, 8 feet; for dwarf round-headed trees on paradise stocks, 6 feet.

PEARS.—Large growing standard varieties, on pear stocks, 20 feet; dwarf standards on quince (with stems pruned up 2 or 3 feet, the heads with natural growth, or slightly thinned by pruning but once a year, for orchard culture,) 8 feet; pyramids on pear stocks, 8 to 10 feet; on quince, 6 feet. It should never be forgotten that pears on quince should be so placed as to admit of high or enriching cultivation. It is quite useless to plant them and then neglect giving them the best care.

PEACHES.—It is usual to allow about 20 feet for peach trees that are never shortened-in, but permitted to spread out and take their natural course. But if shortened-in annually as they should be, or even triennially, by cutting back three-year branches, they may occupy only 12 feet. Peach trees budded on the plum, which reduces their growth a little, may be kept cut back so as to require a space of only 8 or 9 feet.

CHERRIES.—Common standards, 20 feet apart; pyramids on common stocks, 10 feet; on Mahaleb stocks, 6 feet. Dukes and Morellos require only three-fourths of this space.

PLUMS.—Standards, 15 feet; pyramids, 8 to 10 feet.

APRICOTS.—One-fourth more space than for plums.

QUINCES.—6 to 8 feet.

GRAPES.—Most vigorously growing native sorts, on a trellis 8 feet high, 25 feet apart; on a 12 feet trellis, 16 feet apart. Foreign grapes, one-half this distance.

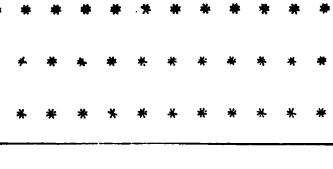
GOOSEBERRIES and CURRANTS.—4 to 5 feet.

RASPBERRIES.—3 to 4 feet.

For the above distances, the following is the number of trees required for an acre:

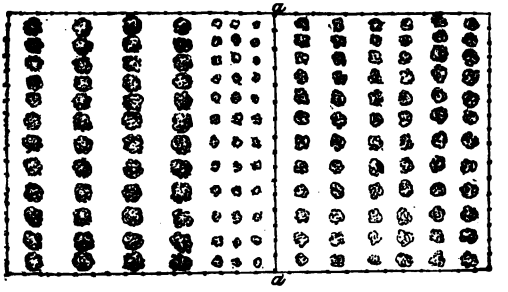
40 feet apart,	27 trees.		12 feet apart,	302 trees.	
33 "	40 "		10 "	435 "	
25 "	69 "		8 "	680 "	
20 "	108 "		6 "	1,208 "	
15 "	193 "		4 "	2,720 "	

Having determined the distances, the next step is to lay out the plans for digging the holes. For simple square planting, it is only necessary to measure off the given distances on the four boundaries of the square lot, and then by stretching a cord, or staking straight lines, the points of intersection will be the places for each tree. The rows are thus laid out perfectly straight, which is an important convenience in cultivation, and avoids the difficulties of the crooked rows which are sure to result from a careless mode of beginning. This square mode of planting is best for large apple orchards. For smaller plantations, and for other kinds of trees, it is sometimes convenient to place the trees in thick rows, allowing more space between each row, as represented in the figure below. Along

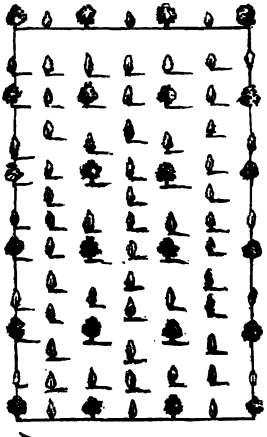


these rows the plow may be passed, cultivating a strip of ground several feet on each side, but leaving the rest of the ground between them for grass or other crops. While the trees are small this mode admits of deep and thorough cultivation on that portion of the ground which needs it most.

The following figure exhibits a mode of arrangement which may be adopted where trees growing to different sizes are to be placed in the same enclosure, giving different spaces for each tree according to its



need, and yet placing all in rows so as to allow horse cultivation both ways. The larger growing kinds, as apples, pears, cherries, &c. occupy the wider rows, and dwarf pears the narrower. Those of intermediate size, such as plums and apricots, are planted at medium distances. These being liable to be stung by the curculio, occupy one end of the enclosure, so that as soon as the young fruit begins to form, a temporary fence (*a a*) is run across, and pigs and poultry confined in this part. These animals prove one of the most easy and efficient destroyers of the curculio, eating all the punctured and wormy fruit that falls.



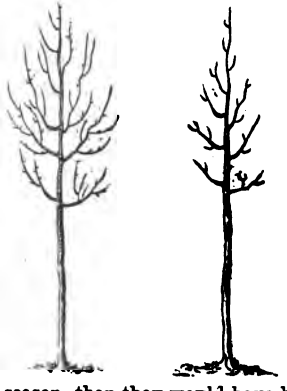
Barry's "*Fruit Garden*" furnishes the following plan for a *pear* orchard.

"Standard pears do not require so much space as apples, their branches generally are more erect. In this country standard pears should not have naked trunks over four feet high at most, and twenty-five feet apart is quite sufficient; at this distance an acre will contain about seventy trees. These, as a general thing, will not begin to bear until the tenth year, unless artificial means be resorted to. By putting one pyramid, or low standard, between each in the same row, and a row ten feet apart between each row of standards, as in the annexed figure, we can plant 250 dwarfs, or pyramids, that will commence bearing the third year, and will be in full bearing the fifth; yielding not less on a average than $1 to $2 per tree."

TRANSPLANTING.

To transplant a tree properly, and in such a manner as to check its growth as litle as possible, it must be taken up with the entire mass of its roots, as nearly as possible. Few persons who dig a tree are aware that they are cutting off and leaving in the ground, nine-tenths of the net-work of finely branching fibres. We have already shown that the roots usually extend to a distance about equal to the height of the tree. The annexed fig. will show the result of the usual mode of digging, *a* representing the foot of the tree, *b b* the circle cut by the spade, and without this the roots left in the ground.

It is impossible to avoid mutilating the roots to some degree, but the less the better; and some kinds of trees recover more speedily from its effects than others. The peach, for example, is remarkable for quickly reproducing new shoots, and hence if the top be lopped in a corresponding degree to the mutilation of the roots, new shoots will soon be thrown out, and the tree speedily recover from the effects of transplanting, provided the best cultivation is given at the same time. On the other hand, the cherry is very slow in reproducing shoots, and is easily injured and checked by much trimming, and it is therefore important to secure as nearly as possible the entire removal of the roots. Apple trees are intermediate between the peach and cherry in this respect, and hence the tops should be more sparingly pruned than the peach, in transplanting. An excellent rule to apply in such cases, is to cut off only a certain portion of all the *one-year* shoots. For instance, three-fourths to nine-tenths of each shoot may be taken off from *peach* trees; one-fourth to one-half from apple trees; and very few if any from cherry trees. The annexed figures represent the appearance of an apple or peach tree before and after the pruning is performed, showing that the form of the head is not at all disturbed by the operation, and that with the exception of one year's growth, even the size is not interfered with. By this treatment, peach trees will send out such vigorous shoots, as to become really much larger by the close of the first season, than they would have been if the entire tops had been left upon



them; and apple trees in most cases will lose nothing in size, but gain much in vigor. Another advantage of this free shortening of the peach roots consists in the safety with which trees of large size will bear transplanting; for while by the common mode two-year trees are regarded as large enough, a free cutting-in of the tops has enabled us to remove trees four years from the bud not only without loss in a single case, but with an immediate reproduction of thrifty shoots.

Much has been said and written on the best modes of setting the young tree in the soil. The best modern practice embraces the following requisites, after the tree has been carefully dug up, the soil properly enriched, and the holes prepared for their reception.

1. Paring off with a knife, those parts of the roots which have been bruised or wounded with the spade, so as to prevent decay.

2. If the weather is dry, or the roots have become dried out of the ground, dipping them into a bed of soft mud, to coat their surface.

3. Setting the tree no deeper than it stood before, except it be an inch or two to allow the settling of the soil.

4. Spreading out the fibres in every direction as widely and evenly as possible, while fine mould is sprinkled or sifted in among them to fill up the hole.

5. Dashing in a few quarts of water when the hole is nearly filled, or pouring it from a watering-pot while filling, to settle the earth closely among all the fine roots, and leave no interstices. Afterwards, the filling is completed by a layer of dry, mellow earth. This mode of settling the earth is much better than treading with the foot.

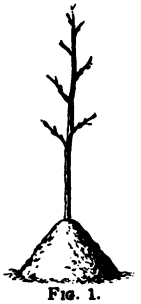


Fig. 1.

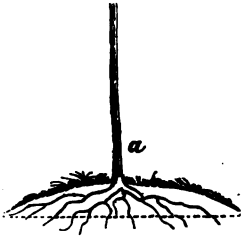
Trees that are set in autumn, will need stiffening against the winter winds. If they are of modederate size, a mound of earth will be sufficient, embanked about the tree as shown in fig. 1. Such a mound also tends to protect the roots from the influence of winter frost. It is to be removed and spread in the spring. In windy situations, and with larger trees, staking may be necessary. To avoid hitting the roots, the stake sould be driven before the hole is filled. Fig. 2 represents the operation as completed, the straw bands being so tied between the tree and the stake, as to prevent all possibility of chafing the bark.

Fig. 2.

SEASON FOR TRANSPLANTING

A great deal of argument has been used in favor of autumn and spring transplanting respectively, and each season has its strenuous advocates. As a *general* rule, we advise planters to do the work when they have time to do it *well*; for after all, the subsequent treatment of trees has more to do with their success, at least twenty-fold, than the season of the year for setting. Hardy trees, as the apple, may do rather better if transplanted in autumn, as they get an earlier start in spring. Tender trees, as the peach and apricot, although they frequently do well, are sometimes injured by unusually unfavorable winters, or such as are accompanied with frequent and sudden changes, and especially very

severe cold after long rains. On heavy soils, a very wet winter will be quite sure to destroy more or less of them, unless well drained. It will be safest perhaps, in all cases to set peach trees in spring; and when they are received from a distance in autumn, to bury the roots and a considerable portion of the stems, in fine mellow earth, where mice cannot reach them, *taking great care to fill the interstices among the roots.* If on a dry spot they will keep safely in this way through the hardest winters. Or if they must be set out at once, a high and broad mound such as that already described for stiffening the tree, will afford ample protection for the roots.



It will contribute much to their safety, on soils the least liable to become water-soaked, to plant the tree, without digging a hole on the surface of the ground, raising the earth upon the roots, as shown in the figure, where the dotted line represents the natural surface.

AFTER-MANAGEMENT AND CULTIVATION.

The young orchard having been properly transplanted, the most important part of the management is yet to come. The three chief requisites under this head, are *watering*, *mulching*, and *cultivation of soil*.

Watering. If the other two requisites are attended to, it is very rare that any watering is needed by the newly transplanted tree. Before the leaves open, very little moisture escapes through its stem and branches. Pouring on large quantities of water at this time, is therefore not only needless, but often very hurtful, by causing water-soaked roots, and tending to induce decay. The best way in which water may be applied to such trees, is to wet the bark every day at evening, and oftener if they are shrivelled, maintaining a moist surface if necessary by a thin coating of straw over the stem. Trees apparently dead have been restored to full foliage by this process.

After their expansion the leaves throw off water rapidly. But even then, water will do more harm than good unless properly applied. *We have known many trees killed by drouth occasioned by watering.* A little has been poured upon the surface, but which never reached the roots, and caused only a hard crust, depriving the soil of that fine sponge-like quality which enables it to retain moisture. Whenever it becomes requisite to apply water, a few inches of the top should be first taken off, the water poured in directly on the roots, and then the earth replaced, taking care to make it fine and mellow.

Mulching, in connection with a mellow surface, will in nearly all cases entirely obviate watering. This is nothing more than covering the ground about the tree with old straw, coarse barn-yard litter, leaves from the woods, saw-dust, tan, or other materal tending to retain the moisture of the soil, which is otherwise constantly escaping from the earth below. It is usually applied much too thinly, and in too small a circle about the tree. We have already shown that the roots extend to great distances. It is better to leave a small space uncovered *immediately* about the trunk. otherwise mice may harbor under it and eat the bark.

Newly set cherry trees are almost sure to perish during the heat of dry summers unless well mulched, even after they have commenced a vigorous growth early in the season.

The annexed figure exhibits the uselessness of mulching and manuring as often applied close to the foot of the tree, while the roots far beyond, receive no benefit. Application to a broader surface is insdispensable.

CULTIVATION OF THE SOIL.

The most important of all operations in connexion with the culture of fruit, and that on which the rapid growth, early bearing and abundant crops of the trees and the large size and high quality of the fruit, mostly depends, is the cultivation of the soil.

"It is the more important," says the American Fruit Culturist, "because it is not commenced and finished in a day, but needs constant attention for years; and in ordinary practice it receives greater neglect. For, of the thousands of trees which are every year transplanted in all parts of the country, the assertion may be made with safety, that *more are lost from neglected after-culture than from all other causes put together.*

"To purchase and set out fine fruit trees of rare sorts, in a baked and hardened soil, whose entire moisture and fertility are consumed by a crop of weeds and grass, might very aptly and without exaggeration be compared to the purchase of a fine horse, and then perpetually to exclude him from food and drink.

"Here is the great and fatal error with a large portion who attempt the cultivation of fruit. We may not incorrectly divide these into three classes:

"1. Those who, having procured their trees, destroy them at once by drying them in the sun or wind, or freezing them in the cold, before setting out.

"2. Those who destroy them by crowding the roots into small holes cut out of a sod, where, if they live, they maintain a stunted and feeble existence, like the half-starved cattle of a neglectful farmer.

"3. Others set them out well, and then consider their labors as having closed. They are subsequently suffered to become choked with grass, weeds or crops of grain—some live and linger, others die under the hardship; or else are demolished by cattle, or broken down by the team which cultivates the ground.

"A neighbor purchased fifty very fine peach trees, handsomely rooted and of vigorous growth; they were well set out in a field containing a fine crop of heavy clover and timothy. The following summer was dry; and a luxuriant growth of meadow grass nearly obscured them from sight. What was the consequence? Their fate was precisely what every farmer would have predicted of as many hills of corn, planted and overgrown in a thick meadow,—very few survived the first year.

"Another person bought sixty of worse quality in growth; he set them out well, and kept them well hoed with potatoes. He lost but one tree; and continuing to cultivate them with low hoed crops, they now afford yearly loads of rich peaches.

"Another neighbor procured fifty good trees. Passing his house the same year late in summer, he remarked, "I thought a crop of wheat one of the best for young peach trees?"—"Just the reverse; it is one of the worst—all sown crops are injurious; all low hoed ones beneficial."—"Well," answered he, "I have found it so—my fifty trees all lived it is true, but I have lost one year of their growth by my want of knowledge." On examination, they were found in excellent soil, and had been well set out. All the rows were in a field of wheat, except one which was hoed with a crop of potatoes. The result was striking. Of the trees that stood among the wheat, some had made shoots the same year, some an inch long, some two inches, and a very few, five or six inches. While on the other hand, on nearly every one that grew with the potatoes, new shoots a foot and a half could be found, and on some the growth had been two feet, two and a half, and three feet. Other cases have furnished nearly as decisive contrasts.

"Trees are frequently mutilated in cultivating the ground with a team;* to obviate this difficulty, arrange the horses when they work near the line of trees, one before the other, *ad tandem*. Let a boy ride the forward one, use long traces and *short whipple-tree*, and place the whole in the charge of a careful man who knows that one tree is worth more than fifty hills of corn or potatoes, and no danger need be feared. In the absence of this arrangement oxen will be safer than horses.

Fig. 1.

When it becomes necessary for trees to stand in grass, as in some instances near dwellings, a circle of several feet round each tree must be kept mellow by the spade, fig. 1. The work should be shallow near the tree to prevent injury to the roots, and gradually deepen as it recedes. This operation when repeated several times during summer, has been known to increase the growth five fold. But a

Fig. 2.

* When bark is accidentally rubbed off, if in early summer, the fresh surface should be left untouched, and a new bark will soon form and cover the surface. Rubbing the wound with earth, spoils this surface, and leaves a bad wound

not less important result is the exclusion of the mice, for which this is by far the most effectual method, if the surface is raised nine or ten inches round the tree just before winter, fig 2. The grass no longer affords these animals any hiding place, and when they reach the bank of fresh earth, they are immediately diverted from their course, and never attack the stem. To this we may add that we have never known this practice of raising a small mound of fresh earth, to fail in completely protecting young trees from mice, even when standing near thick grass, out of many hundreds of instances.

All low *hoed* crops are best for young orchards, such as beans, turnips, field beets, and carrots. Sowed grain crops are bad, and meadows still worse. But even hoed crops operate in some degree as weeds, and hence the most successful orchardists keep the whole surface in clean, mellow cultivation, without any crop whatever, and find it most profitable. The only exception they make is in planting a portion of the space in very young orchards, several feet distant from each tree.

All orchards should be manured as often as once in three or four years, and dwarf pears which need very high culture, should be well manured annually; for which purpose a heap of good compost should always be ready, and a peck or half a bushel applied to each tree. All manuring should be in autumn.

PRUNING.

Some kinds of fruit trees need but little pruning, as for example the cherry and standard pear. Others, again, need a large amount, as the dwarf pear and the peach. We have only space here to point out some of the leading particulars.

Pruning the Apple. The chief object is to preserve a good form to the head, and to prevent a thick and brushy growth of the branches. If care is taken to preserve a good shape at the beginning, very little pruning will be afterwards needed, except occasionally rubbing off, or cutting off with the knife, any unnecessary, crooked, or straggling shoots. If this "thumb and finger" or "knife-pruning," as it is termed, is timely attended to, the saw and the axe need not be called into use afterwards.

Pruning the Peach. No tree is more neglected, and none more benefited by pruning than the peach. When it first comes into bearing, the head is evenly filled with thrifty shoots, and the fruit is large and of excellent quality. But in a few years the shoots in the centre of the head die out, leaving a dense mass of leaves and branches on the outside only. The thriftiness has diminished, and the fruit is smaller and inferior in flavor. This process continues until the tree consists only of long naked branches with a few leaves and fruit on the extremities, which the weight of the crops, operating like a lever on the ends, has bent down, and given a wide spreading form to the tree, as shown in fig. *a*.

FIG. *a*

Pruning will obviate this result. The *shortening-in* method is the only one to be adopted, and is performed in two ways. One, consists merely in cutting back every winter or spring, every one year's shoot on the tree, so as to leave about one-half or one-third of each. This pre-

FIG. *b.*

vents the branches from extending into long arms, lessens the outside foliage and permits a growth of good shoots through every part of the head, as represented by fig. *b*. At the same time that it increases the vigor of the tree, it thins the crop, and prevents that very common cause of poor fruit, *overloading*. The size and flavor of the fruit is therefore greatly improved by this treatment. At the same time, the trees being preserved in a compact form, they may be placed much nearer together, and more than twice as many planted on an acre.

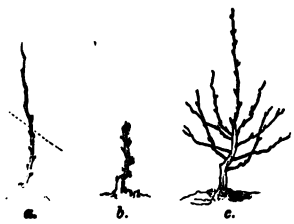
But there is one difficulty. The labor of cropping every shoot yearly, is too great to be thought of by most cultivators who have large orchards. The best mode in such cases is to cut off every few years, considerable portions of the branches, so as to give a neat rounded form to the head, at the same time taking special care to avoid two errors, viz. 1, shearing all over evenly like a hedge, and 2, leaving stumps projecting all over the tree. These errors are avoided by THINNING-BACK, and by always cutting at a *fork* where no bare stump can be made.

PRUNING THE DWARF PEAR.

In consequence of the frequent inquiries that are made for information on this subject, we are induced to give full directions, which we cannot furnish better than by quoting the following from the American Fruit Culturist:

Pyramids. For pyramids, (a form of training applied most frequently to dwarf pears,) the early treatment is quite different from that of standards. As the sap tends to the summit of the tree, producing the strongest side-shoots towards the top, and the shortest and most feeble towards the bottom, the natural form of the tree gradually becomes a trunk or stem with a branching head. To prevent this result, and give a strong broad set of branches at the bottom, a thorough and regular system of shortening-down must be adopted at the outset. The following is a brief outline of the course usually pursued.

After the single shoot from the bud has grown one season, (fig *a*,) it is cut down so as to leave not over one foot, and if the tree is weak not over six inches, (fig. *b*.) As a consequence, the buds on this remaining portion, receiving all the sap, make a vigorous growth. The upper one must be converted into a leader, by pinching off early the tips of the others, beginning first with the upper ones which will be the strongest, and gradually descending as the season advances to the lower ones, which should be left the longest in order to give them the most strength, (fig. *c*.) Six inches of naked stem below the branches should be left, by rubbing off all shoots below; and if in a region liable to deep snows, this space should be a foot, to prevent splitting off the limbs by the weight of the snow, and for which object the tree should not be cut down lower than eighteen inches at the close of



a. *b.* *c.*

the first season. The pruning after the second year's growth, consists in cutting down again the leader for a second crop of side shoots; and these side shoots, and the new leader, are to be treated precisely as those below were treated the year before. At the same time, the last year's side shoots, on the lower part, are to be cut back, (the longest at the bottom so as to give a pyramidal form,) in order to insure the growth of the buds upon them. The new side shoots thus caused, are to be pinched off so as to convert them into fruit spurs, (according to the process described hereafter in this chapter,) except one shoot left on each as a leader, and another, if needed, to fill up the space made by the widening limbs. The pyramid may now be said to have been fairly formed; and it is only requisite to continue and prolong the same process for successive years. Fig. *d*, represents a four-year pyramid three times pruned, each section being shown at the figures 1, 2, 3, and the cross-lines indicating the place for the fourth pruning. Fig. *e* represents a perfectly pruned pyramid in bearing.

d.

e.

After the tree has attained sufficient size, its further extension is prevented by pruning back the shoots. If the fruit spurs become too numerous, a part of them are to be pruned closely out, so as to give an even and not crowded crop. When spurs become too old, they may be mostly removed for new ones to spring from their bases.

Some varieties of the pear throw out side shoots spontaneously the first year. Such trees may be treated in a manner not unlike the ordinary two-year pyramid. On the contrary, such sorts as have small or flat buds, may need a more severe cutting back than others, in order to arouse the buds into action and induce them to break into shoots.

Throughout the whole process of pruning and training pyramids as well as every other tree, the frequent error of allowing the shoots and branches to become too thick and to crowd each other, should be carefully avoided. The size and beauty of the fruit, and its perfection in richness and flavor, where there is plenty of room for the full, vigorous, and healthy development of the LEAVES *which supply all the material for the growing fruit*, will repay well the labor required for this excellent result.

GRAFTING.

The following directions for grafting and budding, arecopied from the last edition of the "American Fruit Culturist."

There are two chief requisites for success: the first, that the graft be so set in the stock, that the sap may flow upward without interrup-

tion; and the second, that the forming wood may flow downward uninterruptedly through the inner bark. To effect these two requisites, it is needful, *first*, that the operation be performed with a sharp knife, that the vessels and pores may be cut smoothly and evenly, and the two parts be brought into immediate and even contact. *Secondly*, that the operation be so contrived that a permanent and considerable pressure be applied to keep all parts of these cut faces closely together. *Thirdly*, that the line of division between the inner bark and the wood, should coincide or exactly correspond in each; for if the inner bark of the one sets wholly on the wood of the other, the upward current through the wood and back through the bark, is broken, and the graft cannot flourish or grow. And, *fourthly*, that the wounded parts made by the operation, be effectually excluded from the external air, chiefly to retain a due quantity of moisture in the graft, but also to exclude the wet, until by the growth of the graft, the union is effected.

1. The first requisite is best attained by keeping a keen, flat bladed-knife to cut the faces, and another knife for other purposes.

2. The second requires that the jaws of the stock in cleft-grafting, press with some force, but not too much, against the wedge-shaped sides of the graft. A stock one-third of an inch in diameter will sometimes do this sufficiently; but three-quarters of an inch is a more convenient size. In whip-grafting, the tongue and slit should be firmly crowded or bound together.

3. The third requisite is attained by close examination with the eye.

4. The fourth is accomplished by plasters of grafting-wax or by the application of grafting-clay. Grafting-wax may be made by melting together rosin, tallow, and beeswax, in such proportions as to admit of being easily applied when softened by warmth, but not liable to melt and run in the sun's rays. An excellent grafting-wax is made of three parts of rosin, 8 of beeswax, and two of tallow. A cheaper composition, but more liable to adhere to the hands, is made of four parts of rosin, two of tallow, and one of beeswax. But one of the best and cheapest consists of one pint of linseed oil, six pounds of rosin, and one pound of beeswax. These ingredients, after being melted and mixed together, may be applied in different ways. The wax may be directly applied when just warm enough to run, by means of a brush; or may be spread thickly with a brush over sheets of muslin, or thin, tough paper, ("post-office paper" is best,) which are afterwards, during a cold day, cut up into plasters of convenient size for applying; or, the wax, after cold, may be worked up with wet hands, and drawn out into thin strips or ribbons of wax, and wrapped closely around the inserted graft. In all cases success is more certain, when the wax is closely pressed so as to fit closely to every part, and leave no interstices; and it is indispensable that every portion of the wound on the stock and graft be totally excluded from the external air. In cool weather, a lantern, chafing dish or hot brick, will be found necessary to soften the plasters before applying them.

The annexed figures represent the two most common modes of grafting fruit trees; figs. 1 to 4, representing successive stages of *whip or tongue grafting*, from the sloping cut of the scion and stock, to the completion of the operation by the covering with the wax plaster. Fig. 5 shows a stock cut off for cleft-grafting with the upright cleft separated

by an iron or steel wedge, ready for the graft; fig. 6, cut wedge-form to fit it; and fig. 7 the graft in its place after the wedge has been withdrawn, the projecting angle of the stock sloped off with a knife, and the whole ready for the application of the wax.

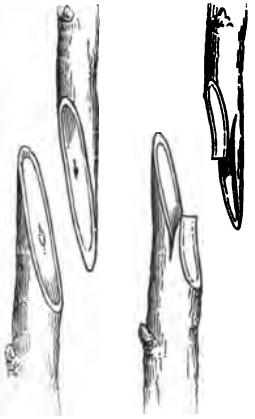


Fig. 1. Fig. 2.

Whip grafting is particularly applicable to small stocks, or where the graft and stock are nearly of equal size; and cleft-grafting to stocks considerably larger than the scion. In all cases where the stock is in any degree larger, the graft must be placed towards one side, so that the line between the bark and wood may exactly coincide at one point at least in both, as in the cross section of cleft grafting, fig. 8.

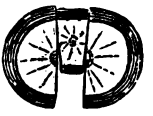


Fig. 8.

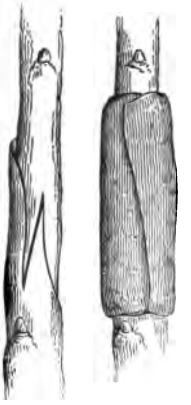


Fig. 3. Fig. 4.

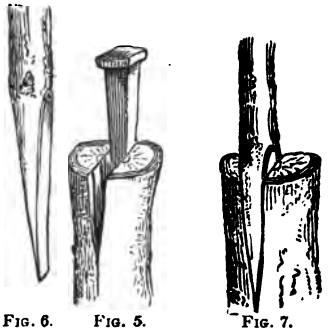


Fig. 6. Fig. 5. Fig. 7.

BUDDING.

Budding consists in introducing the bud of one tree with a portion of the bark and a little adhering wood, beneath the bark of another and upon the face of the newly forming wood. It must be performed while the stock is in a state of vigorous growth. An incision is made lengthwise through the bark of the stock, and a small cut at right angles at the top, the whole somewhat resembling the letter T., fig. 1. A bud is then taken from a shoot of the present year's growth, by shaving off the bark an inch or an inch and a half in length, with a small part of the wood directly beneath the bud, fig. 2. The edges of the bark, at the incision of the stock, are then raised a little, fig. 3, and the bud pushed downwards under the bark, fig. 4. A bandage of bass, corn-husk, or other substance, is wrapped round, covering all parts but the bud. The pressure should be just sufficient to keep the inserted portion closely to the stock, but not such as to bruise or crush the bark, fig. 5.

The shoots containing the buds should be cut when so mature as to be

rather firm and hard in texture; they are usually in the best condition after the terminal bud has formed. To prevent withering, the leaves must be immediately cut off, as they withdraw and exhale rapidly the moisture from the shoot; about one-quarter of an inch of the footstalks of the leaves should remain to serve as handles to the buds while inserting them, fig. 6. After being thus divested of leaves, they may be safely kept a week in a cool damp place, or sent hundreds of miles in damp moss, or encased separately in thin oil-cloth.

FIG. 5. FIG. 4. FIG. 2. FIG. 3. FIG. 1.

FIG. 6

When by growth, the bandage cuts into the stock, usually in ten days or three weeks, it must be removed. The bud remains dormant till the following spring, when the stock is cut off two inches or more above it. If cut closer, the end of the stock becomes dry, and the bud often perishes. All other buds must be then removed, and all the vigor of the stock or branch thrown into the remaining bud, which immediately commences a rapid growth.

To secure a straight and erect growth, the new shoot when a few inches long, is tied to the remaining stump of the stock. By another month, no further support will be needed, and the stump may be wholly cut away and the wound allowed to heal by the rapid formation of new wood.

CATERPILLAR'S EGGS.

DISEASES AND ENEMIES OF FRUITS.

The Apple. The *caterpillar* often injures orchards by stripping off leaves, which check the growth. The eggs may be easily removed in fall or winter, by cutting off the small shoots, which they encircle in cylinders or rings, containing several hundreds each. Or, as soon as they are hatched in spring they may be brushed off or destroyed with soap-suds, or lime wash, applied by a swab on a pole. The *borer* which cuts into the solid wood near the surface of the ground, may be excluded, in

those parts of the country where it proves troublesome, by digging the earth away from the foot of the trunk, and brushing over early in spring a wash made of tobacco water, soft-soap, and flour of sulphur.

CANKER-WORM.

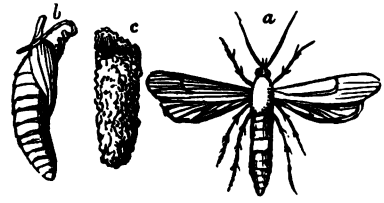
MALE.

FEMALE.

The canker worm attacks both fruit and leaves, and fills the tree with a fine web. One of the best remedies is to encircle the trunk with a canvas belt, coated with a mixture of tar and train-oil, which needs often renewing. This prevents the ascent of the female. Tar applied directly to the bark, injures or kills the tree. The *Blight* destroys the terminal shoots all over the tree; its cause and cure do not appear to be well understood. The *bark-louse* may be removed by scraping, accompanied with a wash of soap or ley, applied early in summer. *Mice* may be kept from young trees by throwing up a small mound of fresh earth around each, late in autumn, as already described.

THE PEAR.—A most formidable and almost the only disease of the pear, is the *blight*, often called the *fire-blight*, from the suddenness with which certain shoots and branches die and turn black as if scorched. It is sometimes caused by insects, but much more commonly by changes of temperature acting upon trees possessing some unknown affection or predisposition to disease. Volumes of argument have been written and published on its causes. The best remedy is to cut or saw off at once the affected limbs, two or three feet below the apparent disease, and bury or burn them. This will mostly check its progress; but where it does not, *keep cutting* as long as any appearance of it remains. No matter if a few trees are chopped to pieces by the process; they would certainly die without it, and probably spread the contagion to others. This remedy often fails because it is not *immediately* applied. Sometimes, but rarely, it appears to be an epidemic, when the remedy for a time may fail.

THE PEACH.—The *borer* or *peach-worm*—(fig. *a*, the perfect insect—*b* and *c*, the pupa and case)—is quite distinct from the apple-borer which cuts the solid wood, while the peach borer only works in the bark. It leaves a thin shell consisting of the outer portion of the bark, and is therefore only visible by the sawdust-like matter which is thrown out of the hole. This worm is easily destroyed by following it with a knife. A large orchard may be examined this way in a day. A small pile of *air-slaked* (not *caustic*) lime, placed round each tree, will tend to prevent the peach-worm entering, but will not destroy it if already present.



The *Yellows* is a very destructive and contagious disease, mostly confined to certain regions of the country or to such as receive trees from infected districts. It first shows itself by the *premature ripening* of the

fruit, two or three weeks sooner than usual; afterwards, small, wire-like shoots are commonly thrown out from the larger branches, the tree dwindles and finally dies. As there is no known remedy, the first thing to do when the disease first appears is to dig it up and burn it, planting no other tree on the site. Good cultivation, on fertile soils, is supposed to be the best preventive.

THE PLUM.—The *black excrescences*, the cause of which is not known, if allowed to spread unprevented, will destroy whole orchards. The remedy is simple, and does not cost more labor than any good cultivation. It is merely to cut off the affected parts, and to *keep cutting* as long as any appear. Large wounds should be washed with a strong solution of *chloride of lime*, which is better than any other wash, and prevents the excrescences from breaking out again in the same place.

The *Curculio* is a great enemy to all smooth stone fruit, stinging the young fruit, making it "wormy," and causing it to drop before ripe. Its ravages may be effectually prevented in nearly all cases, by first yarding off such fruit trees separately from other trees, and then turning in pigs, geese, hens, &c. to pick up the affected fruit that drops, and thus destroy the insects. In addition to this, if white sheets are spread early every morning under the trees, while the little beetles that lay the eggs are inactive from cold, they may be jarred down on these sheets and destroyed by a pinch of the thumb and finger. The blow should be quick and sharp, or it will bring down only a part of the insects. For this purpose a branch should be sawed off, on the stump of which a hammer or axe may be struck briskly without injuring the bark.

CURCULIO.

STUNG FRUIT MAGNIFIED.

With these two modes of destroying the curculio, *combined*, the latter being faithfully applied *every day* as long as any are found, no difficulty need occur in obtaining full crops of plums, apricots, and nectarines.

LIST OF THE BEST FRUITS.

The following list of the best sorts of fruits, has been adopted at the several sessions of the American Pomological Society, and is perhaps as perfect a selection as could be made for general application. But different cultivators, in particular localities, will perhaps prefer leaving out some of them and adding others which experience may prove better adapted to those localities. No two persons would make the same selections throughout, and the list may therefore be modified to suit all.

APPLES.

American Summer Pearmain,	Fall Pippin,
Baldwin,	Fameuse,
Bullock's Pippin,	Gravenstein,
Danvers Winter Sweet,	Hubbardston Nonsuch,
Early Harvest,	Large Yellow Bough,
Early Strawberry,	Lady Apple,

Melon,	Summer Rose,
Minister,	Swaar,
Porter,	Vandervere,
Red Astrachan,	White Seek-no-Further.
Rhode Island Greening,	Wine Apple, or Hays,
Roxbury Russet,	Winesap.

And for particular localities where they may succeed—Esopus Spitzenburgh, Northern Spy, Newton Pippin, Red Canada, Yellow Bellflower.

For northern latitudes—Ribston Pippin; and for strong soils, Williams' Favorite.

New varieties which promise well—Autumn Bough, Benoni, Cogswell, Hawley, Mother, Smokehouse, Primate, Genesee Chief, Monmouth Pippin, Winthrop Greening.

PEARS.

Ananas d'Ete,	Louise Bonne de Jersey,
Andrews,	Madeleine,
Belle Lucrative, or Fondante d'Automne,	Manning's Elizabeth,
	Paradise d'Automne,
Beurre d'Anjou,	Rostiezer,
Beurre d'Aremberg,	Seckel,
Beurre Bosc,	Tyson,
Beurre Diel,	Urbaniste,
Bloodgood,	Uvedale's St. Germain, for baking,
Buffum,	
Dearborn's Seedling,	Vicar of Winkfield,
Doyenne d'Ete,	Winter Nelis.
Flemish Beauty,	*And for particular localities,*
Fulton,	
Golden Beurre of Bilboa,	Grey Doyenne,
Lawrence,	White Doyenne.

New varieties which promise well—Adams, Belle Noel, Beurre Clairgeau, Beurre Superfine, Beurre Sterkman, Brandywine, Beurre Giffard, Chancellor, Compte de Flandres, Collins, Doyenne Boussock, Doyenne Goubault, Doyenne Sieulle, Duchesse d'Orleans or Beurre St. Nicholas, Dumas, Duchesse d'Berri, Fondante de Malines, Grand Soleil, Howell, Fontenay, Jalousie, Kirtland, Kingsessing, Limon, Nouveau Poiteau, Ott, Onondaga, Pratt, Pius Ninth, Rousselet d'Esperen, Sheldon, St. Michael Archange, Stevens' Genesee, Van Asche, Theodore Van Mons, Walker, Zepherine Gregoire.

PEACHES.

Bergen's Yellow,	George the IVth,
Cooledge's Favorite,	Grosse Mignonne,
Crawford's Late,	Morris White,
Early York, *serrated,*	Old Mixon Free
Early York, large,	*And for particular localities,* Heath Cling.

APRICOTS.

Breda,	Large Early,	Moorpark.

NECTARINES.

Downton,	Early Violet,	Elruge.

PLUMS.

Bleecker's Gage,
Coe's Golden Drop,
Frost Gage,
Green Gage,
Jefferson,
McLaughlin,
Purple Gage,
Purple Favorite,
Reine Claude de Bavay,
Washington.

Lawrence's Favorite, *And for particular localities*, Imperial Gage.

New varieties which promise well—Prince's Yellow Gage, Italian Prune or Fellenberg, Ives' Washington, River's Favorite, St. Martin's Quetche.

CHERRIES.

Belle Magnifique,
Black Eagle,
Black Tartarian,
Downer's Late,
Downton,
Elton,
Early Richmond, for cooking,
Graffion or Bigarreau,
Knight's Early Black,
May Duke.

New varieties which promise well—Bigarreau Monstreuse de Bavay, Blackhawk, Early Purple Guigne, Gov. Wood, Great Bigarreau, Hovey, Kirtland's Mary, Ohio Beauty, Reine Hortense, Rockport Bigarreau, Walsh's Seedling.

GRAPES.

Under Glass.
Black Hamburg.
Black Prince,
Black Frontignan,
Chasselas de Fontainbleau,
Grizzly Frontignan,
White Frontignan,
White Muscat of Alexandria.

Open Culture.
Catawba,
Isabella,
Diana.

RASPBERRIES.

Fastolf,
Franconia,
Red Antwerp,
Yellow Antwerp.

Promising well.
Knevett's Giant.

STRAWBERRIES.

Boston Pine,
Hovey's Seedling,
Jenney's Seedling,
Large Early Scarlet.

For certain localities,
Burr's New Pine.

Promising well.
Walker's Seedling.

CURRANTS.

Black Naples,
May's Victoria,
Red Dutch,
White Dutch,
White Grape.

GOOSEBERRIES.

Crown Bob,
Early Sulphur,
Green Gage,
Green Walnut,
Houghton's Seedling,
Iron-monger,
Laurel,
Red Champagne,
Warrington,
Woodward's Whitesmith.

FARM BUILDINGS.

PLAN OF BARN AND STABLES.

We furnish the accompanying plan and elevation of a set of Farm Buildings, so arranged that those who have but limited means, may begin with a portion and add from time to time, as means and circumstances may warrant. These buildings when completed, form nearly a hollow square, the main building or barn being in the center of the further range. This forms a sheltered yard for the domestic animals, in the center of which is the manure or compost heap, occupying a hollow to prevent the escape of the liquid manure. The cleanings of the stables are daily conveyed to this heap by wheelbarrows.

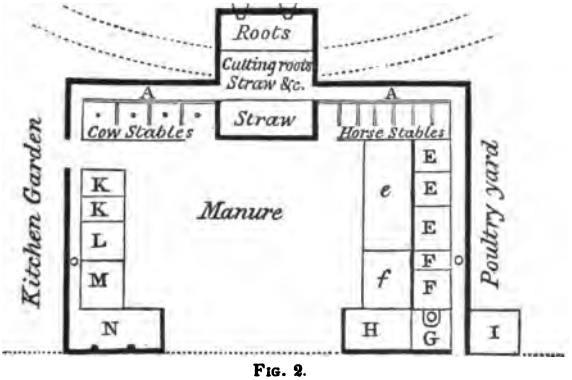


FIG. 2.

Fig. 2 is the plan of the whole when completed, as it lies on the level of the ground. Fig. 3 is that portion of the barn situated immediately over that part represented in fig. 2, which is banked up with earth or dug in the ground, so that the further part of the ground plan shall constitute a cellar for roots, and a space for cutting roots, straw, &c. adjoining it. The curved dotted lines show the wagon track on this embankment for entering the floor in fig 3, lying directly over the cutting room. The root cellar is furnished with two broad, hopper-like troughs,

passing through the cellar windows, into which the cart loaded with roots is "dumped," in filling the cellar.

By building *wings* for the horse and cow stables, (as the plan exhibits,) the central part or barn need not be so large as ordinary barns, saving much heavy timber in the frame, and assisting in forming the hollow square as a shelter.

On the second floor, fig. 3, G is the granary, and C the corn crib, both of which are filled from the floor, and may be unloaded directly into a wagon under them in the yard below, or drawn off through a shute for the horses in the stable. The bay for straw extends upwards as high as the top of these granaries, over which is a space for unthreshed grain. The horse power of the threshing machine, if a common movable one, is placed on the ground outside, and as soon as the grain is threshed, the straw is conveniently deposited into this bay, perfectly secure from injury by weather.

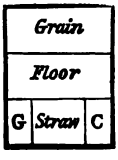


FIG. 3.

The better way is for every farmer to have his own horse power and thresher, that he may employ his time whenever most convenient. The best two horse endless-chain power, will occupy but little room in "space for cuting roots, &c." from which a band may run up to the thresher on the floor above. This power may be used with perfect facility likewise in cutting straw, slicing roots, winnowing, sawing wood, turning grindstone, &c.

The roots lying on one side of this space, and the straw on the other, contribute greatly to the convenience of using them; and as soon as prepared by cutting, the feed is given to the animals on either side by means of the alley, A A.

It will be perceived that the barn is occupied with grain and straw, while the spacious lofts over the stables are filled with hay, which is thrown down to the animals below as wanted.

The building, and its two wings, now described, may be built first; and the addition hereafter mentioned may be added afterwards.

These additional buildings may be occupied by sheep sheds at E E E, with an open sheep-yard *e*; by piggery, F F, and pig yard, *f*; cooking room, G; house for seasoning stove wood, H; poultry-house, I; calf-house, K K; workshop, L; tool-house, for plows, rakes, harrows, &c., M; wagon-shed, N.

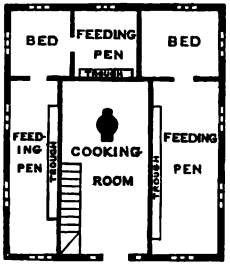
Every part of this range of buildings is entered from the lawn back of the house, by the dry and sheltered passage O O, and A A, from whence all the animals may be examined, instead of the more common way of wading through the mud and manure of the yard.

The floors of the bay loft over the stables, should be made tight, to prevent the vapors from the stables tainting the hay; and ventilators made of square board-tubes, placed over the stables and running up through the roof. Their openings are made to open and shut by sliding boards, according to the weather. The tops of these ventilators are shown in the elevation.

PLAN FOR A PIGGERY.

Of the many designs for piggeries which we have seen, the following, which we copy in part from several now in use, with some additions of our own, suits us the best.

The size may vary with the number of animals to be accommodated; twenty by twenty-five feet on the ground will afford good accommodation for twenty-five or thirty pigs. The lower floor, represented in the



"*plan*," shows the arrangement for their accommodation; the larger animals occupy the wider pen on the right, and the smaller the narrower pen on the left; and being kept entirely separate, there can be no danger of the weaker suffering from the strong; or as sometimes happens when there are many of the smaller, being pressed or smothered to death in their beds. For the accommodation of the smallest in size, the central feeding-pen may be made to admit these only, by a sliding entrance graduated to their exact size, and excluding the larger. Or, sucking-pigs may be kept here, and the dam admitted for regular meals, thus precluding the usual danger of death during night to the young animals by lying upon them. They may be let out into separate yards, attached to the building.

The cooking room is the most convenient room for feeding out. The spouts for carrying the food into the troughs should be large enough to admit its free passage, and wide enough for all parts to be filled at once, and its inner edges should be trimmed with sheet iron to prevent the animals gnawing it. The troughs should be made of the best hard wood plank, (nothing is better than white oak,) and they should be securely fastened to the floor, which should be hard plank, laid smooth, and made tight, so as to admit of the utmost facility of cleaning. The inner partitions should be made of similar material, and a lining of hard plank should extend all round the inside as high as the bottom of the

windows. Without this firm and secure provision, the walls would soon become destroyed by these restless animals.

The food may be cooked in one or more of Mott's furnaces, which will boil a large amount of water with a very small quantity of wood; and in large establishments two of these may be kept constantly employed, the food being cooked in one while it is fed out from the other. The pipe from the furnace passes through the floor above, and by a single elbow enters the brick chimney which is built upon the second floor. A ventilator, as large as a large stove-pipe, surmounted with one of Emerson's caps, or some other equally good, carries off the bad air from the apartments below.

The upper story is used for storing the food, which by means of a square wooden spout with sliding valve, may be conducted from a hopper directly into the boiler below. If the ground at the back of the building should be rising, a platform may be laid, on which the materials for food may be carted or wheeled into the back upper door, (opposite the large window represented in the view,) otherwise a pulley may be fixed over this door for the same object.

The dislike which many persons have to these animals and to their dirty habits, is in a great measure owing to their owner's negligence, in not providing them clean and comfortable quarters. It has been justly remarked that the pig is not positively an admirer of dirt, but there are certain comforts he is determined to have in spite of dirt, if he can get them. It usually happens, however, that the scanty accommodations with which he is furnished, provide him with little of the comforts and plenty of the dirt. In short, no animal is so wretchedly cared for as the pig; very few of them receive comfortable shelter, and still fewer enjoy the luxury of cleanliness. Fortunately, there are a few good managers who have proved that a pig-house may be kept as clean and sweet as any other part of the premises; and who have also proved that filth is a positive discomfort even to these animals, for they are found to thrive and fatten decidedly faster when strict cleanliness is preserved. Even the practice of daily currying hogs has been found by actual experiment to accelerate their fattening, the food remaining the same.

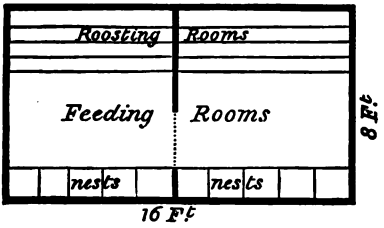
To assist the preservation of cleanliness in every part of the building here described, it is well lighted with windows. They should be made to slide, so as to be opened for ventilation in mild weather. For an additional safeguard, and for excluding an excess of light at any time, they may be furnished with board shutters sliding horizontally inside. In addition to cleaning the pens twice a day, it will be necessary to keep the floor sprinkled with straw, well dried peat or turf, or other similar material to absorb the watery portions of the manure. The contents should not be thrown out of a window or door, forming an unsightly pile near the building, but wheeled off with a wheelbarrow to a proper distance; and as this manure is of a very fertilizing character, and therefore especially worthy of preservation, it should be deposited so as to form a neat compost heap, to which additional layers of turf should be successively added, unless the bedding of the animals supplies all the needed absorbents.

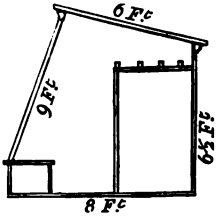
The cost of such a building as this, framed of strong timber, covered with inch and-a-half vertical plank and battened and whitewashed with two coats of lime, will vary from one hundred and fifty to two hundred

dollars, if of the size already mentioned, that is twenty by twenty-five feet. For large establishments, larger dimensions and a greater number of subdivisions of the apartments may be necessary, the general arrangement remaining the same. It may in such a case be most economical to dig a cellar beneath, to be occupied with a steam-boiler, from which the steam may pass up through a pipe into a tight plank box above, containing the food to be steamed, and from which, when cooked, it may be shovelled at once into the feeding troughs. Several experimental farmers have successfully adopted the practice of steaming their corn unground, and even in the ear, a process which, however, requires several hours for its completion, but which saves toll and carrying to mill, but we are not informed that any accurate experiments have been instituted to show the precise amount of saving effected by this process.

POULTRY HOUSE.

The above is a view of a cheap and convenient poultry house, which, by varying its length, may be made to accommodate from one dozen to five hundred fowls. The plan represented below is 16 feet long and 8

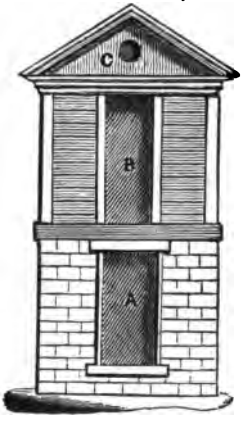




feet wide at bottom and 6 feet at top. The large windows in the sloping wall, throw a very strong light into the feeding room, so necessary to the successful keeping of poultry. The cost, using one-inch matched boards, is about $1 per foot. The plan and section exhibit the arrangement so clearly, as to require no further explanation.

ASHERY AND SMOKE HOUSE.

The following is one of the best modes of constructing a smoke-house and ash-pit combined, that we have met with; in the absence of quarry or cobble stone, hard burnt brick will form a good pit.



The ground plan is seven and a half by five and a half feet; the lower part or ash-house, built of thin quarry stone, the edges dressed to a line with the stone hammer and laid in lime mortar; the walls six feet high. The upper part or smoke chamber, of wood; the sills 6 inches square, and secured with iron anchors incorporated into the walls below, to prevent injury from wind. Sleepers or joists 6 inches deep, are framed across the sills, and a tight, rough floor laid; the sides planked with seasoned hemlock one and a half inches thick, the edges made to fit close, and clapboarded outside. The floor to ash-house stone; the ceiling lathed and plastered, so as to be nearly fire proof; four tin tubes introduced through the floor of the smoke chamber and ceiling of the ash-house below, serve to suppply the chamber with smoke. We build the fire in the ash-vault which is nearly air-tight; a small supply of fuel is sufficient to supply the smoke chamber with smoke for some length of time. By this method we avoid the danger of over heating during the process of smoking, (occasioned frequently by carelessness in the fire builder,) which, in some cases proves ruinous to the ham, for summer use; the danger of firing the building is greatly diminished. The labor and hard work of reaching to and fro in putting up and taking down the hams or other meats is greatly lessened, as we can at all times have a clean floor to stand upon during the process. The hams are kept clean and free from dust, ashes, &c. Should they be allowed to remain through the warm season, by closing the ventilators, are secure from flies and other insects. The chamber being dry, an occasional fire in the ash vault will prevent them from moulding.

A. door to ash-vault—B. door to smoke chamber—C. ventilator which should be in each gable end.

CONSTRUCTION OF CISTERNS.

The great value of an abundant supply of water to houses and barns, and which may be easily had by providing capacious cisterns, renders it important that the cheapest, best, and most convenient mode of construction should be adopted. The two all-essential requisites for underground cisterns, are good hydraulic lime, and a supply of clear pure sand. These must be selected from experience or trial, or by choosing such as have already proved efficient for this purpose. Good hydraulic cement will in the course of a few months become about as hard as sandstone.

When this hardening process does not take place, it must be attributed to bad materials, or to intermixing in wrong proportions. On the latter point, some are misled by adopting the practice employed in mixing *common* lime mortar, the hardest material resulting in this case where the sand constitutes about five-sixths of the whole. But the hardest *water-lime* mortar cannot be made if the sand forms much more than two-thirds of the whole.

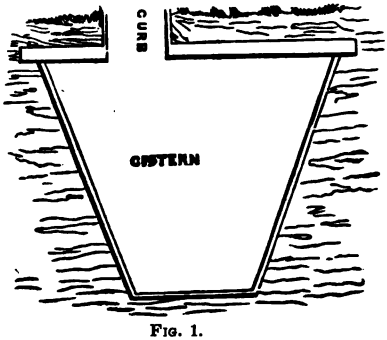


Fig. 1.

A very common and cheap form for the cistern is to dig a round hole into the ground with sloping sides, somewhat in the form of a narrow-bottomed tub, and then to plaster immediately upon the earth, fig. 1. Unless a slope is given to the sides, the mortar cannot be made to keep its place while soft, as it is nearly impossible to find a soil dry and hard enough to retain the plastering by simple adhesion. The top of this kind of cistern must therefore be wide, and consequently difficult to cover very large ones effectually and substantially. The covering is usually made of stiff and durable plank, supported if neeessary by strong scantling, and over this is placed about one foot of earth to exclude completely the frost. A hole with a curb about eighteen inches by two feet, must be left in this covering, for the admission of the water pipe or pump, and to allow a man to enter for cleaning out the cistern when necessary. In cold or freezing weather, it is ndispensably requisite to have this hole well stopped to exclude frost, which would otherwise enter the wet cement or walls, and produce cracking and leakage—a frequent cause of the failureof water-lime cisterns.

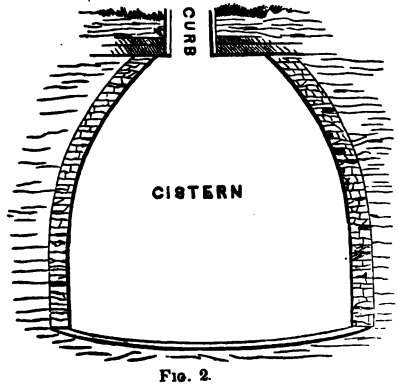


Fig. 2.

This is the cheapest form of such reservoirs, but a better, more capacions, and more durable mode is to dig the hole with perpendicular sides in the form of a barrel, and build the walls with stone or brick, to receive the plastering, (fig. 2.) In consequence of its circular form, operating like an arch, these walls will not be in danger of falling if not more than half the ordinary thickness of similar walls. For large cisterns they should be thicker than for small ones. The walls

should be built perpendicular until about half way up, when each successive layer should be contracted so as to bring them nearer together, in the form of an arch, reducing the size of the opening at the top, and rendering a smaller covering necessary. If the subsoil is always dry or never soaked or flooded with water, the walls may be laid in common lime mortar, and afterwards plastered on the inner surface with the cement. But in wet subsoils, the whole wall should be laid in water-lime. If the bottom is hard earth or compact gravel, a coating of an inch or two may be spread immediately upon the earth bottom; but in other instances the bottom should be first laid with flat stone, or paved with round ones, the cement spread upon these.

The plastering upon the sloping earth walls as first described, (fig. 1,) should never be less than an inch thick, and if the earth is soft, it should be more. On the stone or hard brick walls, (fig. 2,) half an inch will be thick enough. Cisterns can rarely if ever be made free from leaking, without giving them at least two successive coats, and three will be safer—the previous coat in each instance being allowed to become dry and hard.

As the best mortar begins to harden in a very short time after mixing, it is best to mix the lime and sand *dry*, and to apply water to small successive portions as wanted.

FARM IMPLEMENTS.

Nothing shows the advancement of modern agriculture in a more striking light than the rapid improvement in farm implements. Compare, for instance, the old wooden mouldboard bull-plow, with the modern, finished, easy-cutting, cast iron center-draught; or the old-fashioned flail with the best improved threshing machine; observe the difference in the cost of labor between ten men raking with the hand, and a single man and horse sweeping up winrows equally fast with an improved revolver; or the difference between the slow and tiresome work of dropping the minute seed of root crops from the thumb and finger, with the rapid progress made by means of a modern drilling machine;—observe all these improvements, not to mention many others, as a convincing proof of what we have gained in the application of farm-forces. Not a year passes that does not witness some important invention or improvement, or some better mode of applying forces. We propose to describe a few of the most important recent inventions, the value of which has been established by some years' practice.

MOWING AND REAPING MACHINES.

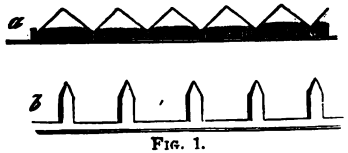


FIG. 1.

These machines are of great importance, on account of the vast amount of heavy work to be done, which comes all at once upon the farmer when the grain and haycrops are ready for cutting. Their late invention and rapid introduction within a few years, have excited a great deal of interest in the farming community. There is one im-

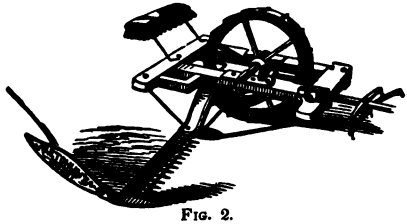
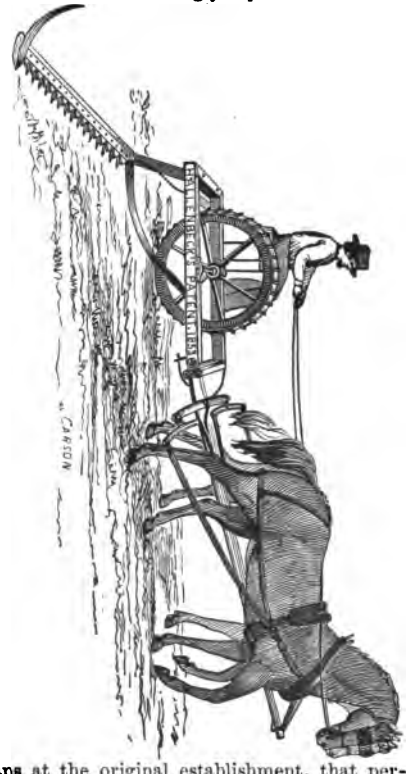


Fig. 2.

portant and leading part in all these machines. This is the cutting blade. It is a serrated knife, (shown in *a* fig.1,) passing through narrow slits in each of the fingers of the piece shown in *b* (same figure,) so that when the blade is made to vibrate rapidly backwards and forwards, it forms a shearing apparatus at every finger, and the whole shaves off the grass or grain like a great number of scissors in exceedingly rapid motion. The appearance of one of these cutting blades is shown in the above figure of *Ketchum's Mowing* Machine, or in the figure of Hallenbeck's Mowing Machine (fig. 3,) represented in motion. This mode of cutting has been invented many years, and is adopted in all the mowers and reapers in this country and in Europe. In some machines the knives have sickle edges, as in McCormick's reaper, and Manny's reaper and mower; while in others they are smooth edged, as in Hussey's reaper and Ketchum's mower, all of which are valuable machines. The smooth edged knives require to be made at more acute angles, as there is no sawing as in the sickle edge.



One of the best Mowing Machines ever made in this country, is *Ketchum's*. already represented, and is shown *in motion*, cutting down a swath of grass, in fig. 4, on the next page. Manny's combined mower and reaper, also cuts grass well, if *well made*, but we have seen some that were probably made by unskillful workmen and not perhaps at the original establishment, that performed badly. This machine is represented in figure 5, on the next page,

FIG. 4.

in motion, the knife being placed between the forward and hinder wheels, and so supported that it may be raised in passing an obstruction. This figure also represents the *reel*, which is attached to most machines, and is also an invention of many years standing. It is used only in cutting grain, and revolves just fast enough to strike the standing grain and press it backwards against the cutting blade, and when cut to cause it to drop backwards. Hussey's and Burrall's reapers have no reel, the grain falling backwards in consequence of the rapid forward motion given to the machine.

FIG. 6.

The principal difference between mowing and REAPING MACHINES consists in a platform attached to the latter, on which the grain falls, and from which it is raked off in bunches for binding, by a man stationed on the machine. This is shown in the accompanying representation of Burrall's reaper in motion, (fig.6.)

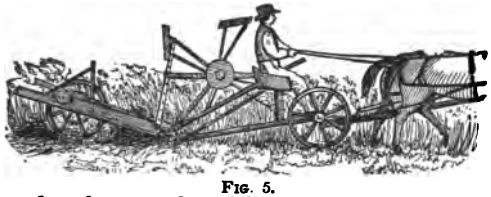


FIG. 5.

The additional labor of a strong active man to rake the fallen grain from the platform, renders the reaper less a labor saver than the mowing machine, and many expedients have been devised to do this work by machinery. None have succeeded so well as *Atkin's Automaton* or self-raker, fig.7, which is a most ingenious piece of mechanism. A rake is made to sweep the platform, and pressing the grain against another rake, both of them with the bundle firmly enclosed, swing round behind, and opening wide, drop it on the ground ready for binding. The chief objection to this machine is its cost, being about $175. or about fifty dollars more than other reapers.

FIG. 7.

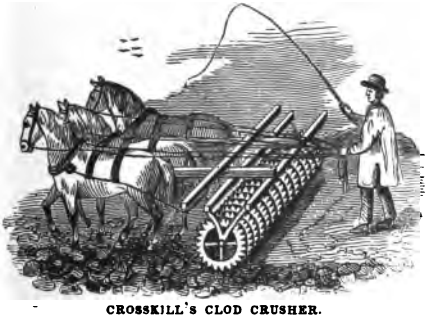
Mowers and reapers are not yet fully perfected, but from the amount of attention bestowed upon them, there is no doubt many improvements will soon be made. They were first introduced into general use chiefly through the labor skill and perseverance of Hussey at the east and McCormick at the west; and more recently other inventors, copying more or less from the two original machines, have rendered the public very important services. Ketchum's mower has for some years sustained a high reputation as a grass cutter, and none surpass it at the present time. Manny's is the best combined mower and reaper of established reputation. The best reapers whose merits are well known, are McCormick's, Hussey's, Burrall's, Manny's, Atkins' Automaton, and a few others of more local use.

Perhaps the best trial, showing the power of reaping machines, was a recent one in Illinois, between Manny's and Atkins'—where the former cut *twenty acres* of wheat in *ten hours and three minutes*, and the latter the same quantity in *twelve hours* and forty-four minutes—this time including watering the teams, oiling machines, clearing usual clogging, &c. There was no change of team in either case, but that attached to Manny's reaper was much the largest and hardiest.

CROSSKILL'S CLOD CRUSHER AND N RWEGIAN HARROW.

We have long been convinced, that an immense loss is sustained by not sufficiently pulverizing adhesive soils. Manure cannot be intermixed with a stratum of clods; moisture is badly retained, seeds vegetate imperfectly, sowing and planting are difficult, and clean cultivation impossible. CROSSKILL'S CLOD CRUSHER has been thoroughly tried in England, and so great are its advantages, that thousands are now in use. We cannot better describe its efficacy, than in the words of the late report of the trial of implements, by the Royal Agricultural Society of Ireland: "This implement fully maintains its character, and perhaps few contrasts are greater than to see an array of men during a dry spring, breaking the stiff clods one by one, with mallets, in preparation for a green crop—and this powerful crusher reducing a breadth of six feet, with three horses, after the grubber (an instrument like our hook-toothed cultivator,) has raised them to the surface."

For the information of those who may not be familiar with its construction, we may simply state that it consists of about two dozen circular cast iron disks or circles, placed loosely upon an axle, so as to revolve independently of each other. Their outer circumference is serrated or formed into teeth, which in revolving, while rolling over the ground, press upon and crush the clods. Every alternate disk has a larger hole for the axle which causes it to rise and fall while turning over, and to prevent the two con-



CROSSKILL'S CLOD CRUSHER.

tiguous ones from clogging. This machine is said to assist materially in destroying the grub and wire-worm, and to be greatly superior to the roller for young crops of wheat. *The Norwegian Harrow* is somewhat similar in its mode of action, and may be used both on moist and dry soils. It pulverizes in a very perfect manner, turning up the fine earth, instead of consolidating it. The rows of star-shaped tines play into each other and produce a complete self-cleanning action. It requires about the same amount of draught as the common two-horse plow.

NORWEGIAN HARROW.

We believe the introduction and cheapening of both these machines, would prove of the highest benefit to most of our lands. American farmers have long been deficient in tools and machines for working their soils, and the loss has consequently been much greater, at least on large farms, than the cost of pulverizers. This is likewise true of subsoilers, cultivators,&c.

WIND-MILLS.

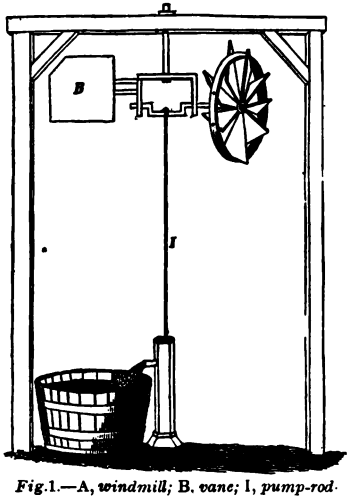


*Fig.*1.—A, *windmill;* B. *vane;* I, *pump-rod.*

The force of wind may be usefully applied by almost every farmer, as it is a universal agent, possessing in this respect great advantages over water-power, of which very few farms enjoy the privilege.

Wind may be applied to various purposes, such as sawing wood by the aid of a circular saw, turning grindstones, and particularly in pumping water. One of the best contrivances for pumping is represented by fig. 1, where A is the circular wind-mill, with a number of sails set obliquely to the direc- of the wind, and always kept facing it by means of the vane, B. The crank of the wind-mill, during its revolutions, works the pump-rod, I, and raises the water from the well beneath. In whatever direction the wind may blow, the pump will continue

working. The pump-rod to work steadily, must be immediately under the iron rod on which the vane turns. If the diameter of the wind-mill is four feet, it will set the mill in motion even with a light breeze, and with a brisk wind will perform the labor of a man. Such a machine will pump the water needed by a large herd of cattle, and it may be placed on the top of a barn, with a covering, to which may be given the architectural effect of a tower or a cupola, as shown in the annexed fig. 2.

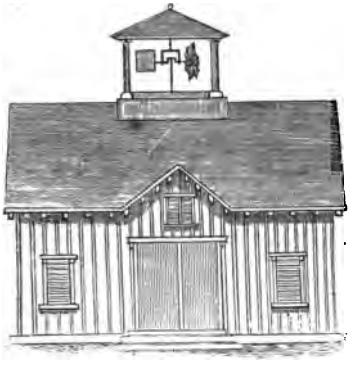


FIG. 2

A more compact machine, but of more complex construction, is shown in fig. 3, where the upper circle moves round with the wheel and vane on the fixed lower circle, to which it is strongly secured so as to admit of turning freely. In other respects it is similar to the preceding

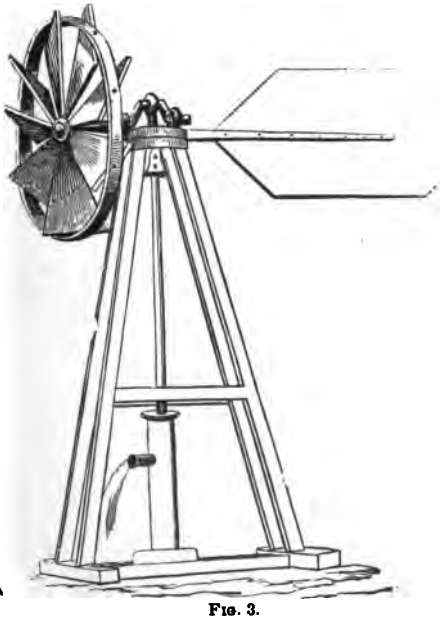


FIG. 3.

In all wind-mills, it is important that the sails should have the right degree of inclination to the direction of the wind. If they were to remain motionless, the angle would be different from that in practice. They should more nearly *face* the wind; and as the ends of the sails sweep round through a greater distance and faster, they should present a flatter surface than the parts nearer the center. The sails should, therefore, have a twist given them, so that the parts nearest the center may form an angle of about sixty-eight degrees with the wind, the middle about seventy-two degrees, and the tips about eighty-three degrees.

In order to produce the greatest effect, it is necessary to give the sails a proper velocity as compared with the velocity of the wind. If they were entirely unloaded, the extremities would move faster than the wind, in consequence of its action on the other parts. The most useful effect is produced when the ends move about as fast as the wind, or about two thirds the velocity of the average surface.

The most useful wind is one that moves at the rate of eight to twenty miles per hour, or with an average pressure of about one pound on a square foot. In large wind-mills, the sails must be lessened when the wind is stronger than this, to prevent the arms from being broken; and if much stronger, it is unsafe to spread any, or to run them.—[*From "Farm Implements," by J. J. Thomas.*]

Wind-mills for farm purposes, are apt to be broken by storms. To remedy this difficulty, springs have been attached to the sheet-iron sails, so that the strong wind shall turn them round with the edges to its course, and thus lessen the force of action.

STUMP MACHINES.

The following account of some of the simpler machines for the extraction of stumps from fields, occurs in THOMAS' new treatise on the Principles of Farm Implements, under the head of the application of the *lever* to practical purposes:

A simple contrivance for allowing a succession of efforts in the use of the lever, is represented in the accompanying figure, (fig. 1,) and is used for tearing out the roots of partly decayed stumps. It may be also applied to lifting heavy weights, and to various other purposes. Two pieces of strong, three inch, white oak plank, eight inches wide and seven feet long, are connected at the ends, and are furnished with the movable leg, *d*. Two rows of holes are bored through them, to receive iron pins, which are to serve as fulcrums. A strong lever, *a*, is furnished at one end with a thick iron hook, (shown in fig. 2,) which is first fastened on the root of the stump, and then one of the pins is inserted under the lever. The lever is now elevated, and the other bolt is placed under it. It is next pressed down, and the first bolt elevated one hole higher, and so on till the stump is torn out. To prevent the lever slipping, a notch is made on its under side, on each side of the hook, as shown in fig. 2.

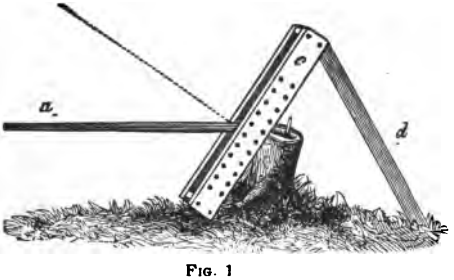


FIG. 1

FIG. 2.

A more powerful stump-extracting machine, made on precisely the same principle, is exhibited by figure 3. The lever, *a*, should be a strong stickof timber, furnished with three massive iron hooks, secured by bolts passing through, as represented in the figure. Small or truck wheels are placed at each end of the lever, merely for the purpose of moving it easily over the ground. The stump, *b*, used as a fulcrum, has the chain passing round near its base, while another chain passes over the top of the stump, *c*, to be torn out. A horse is attached to the lever at *d*, and moving to *e*, draws the other end of the lever backward, and loosens the stump; while in this position another chain is made to connect *g* to *h*, and the horse is turned about, and draws the lever backward to *i*, which still further increases the loosening; a few repetitions of this alternating process tears out the stump. Very strong chains are requisite for this purpose. Large stumps may require an additional horse or a yoke of oxen. Where the stumps are remote from each other, iron rods with hooks may be used toconnect the chains.

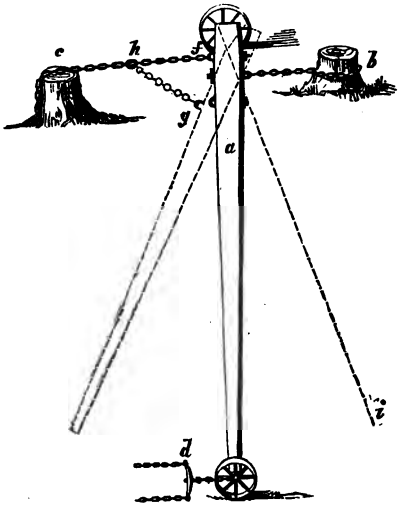


FIG. 3.

The power which may be given to this and to all other modes of using the lever, as we have already seen, depends on the difference between the length of its two arms. A yoke of oxen drawing with a force of 500 pounds on the large arm of a lever 25 feet long, will exert a force on the short arm of six inches, equal to 50 times 500 pounds, or 25,000 pounds, on the the stump.

It was after an examination of the great power which may be given to the lever by increasing this difference, that Archimedes exultingly exclaimed, "Give me but a fulcrum whereon to place my lever, and I will move the earth!" Admitting the *theoretical* truth of this exclamation, and supposing there could be a lever which he might have used for this purpose, its practical impossibility may be quickly understood by computing the whole bulk of the globe; for such is its enormous size and cubical contents, that Archimedes must have moved forward his lever with the strength of a hundred pounds and the swiftness of a cannon ball for eight hundred million years, to have moved the earth the thousandth part of an inch.

FEEDING TROUGHS.

One of the best feeding troughs for sheep, is shown in the annexed figure. It combines more advantages than any other we have met with, and proves, on trial to answer an excellent purpose, both for feeding grain and chopped roots and as a rack for hay. Troughs similar to this have been made for many years, with the exception of the *double trough* below, an improvement described by GEO. GEDDES.

Fig. 1.

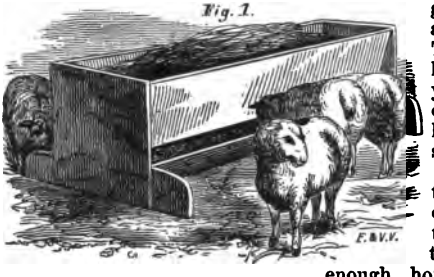
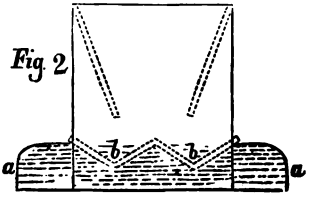


Figure 2 exhibits a section across one of the ends, and shows the structure without any description. It may be well enough, however, to say that the feet (*a a*) should be of thick durable plank, and should be notched, and the lower inch-board (*b b*) nailed in, before the end-boards and upper trough are applied. If the trough is 12 feet long, which is a convenient length, a third plank foot should be placed across the middle. A single board, as a roof, will, if needed, preserve the fodder from the weather or rain. The space between the upper and lower troughs should be just sufficient for the sheep to abstract the feed, and which will wholly prevent the chaff and seeds from entering the wool.

Fig. 2



By selecting plank and boards the right width, so as to require no slitting, a farmer who is accustomed to the use of tools, will make several of these in a day, and a large flock may be soon supplied at a small expense.

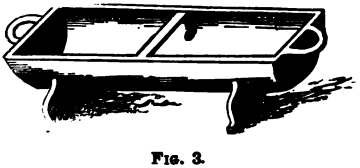


FIG. 3.

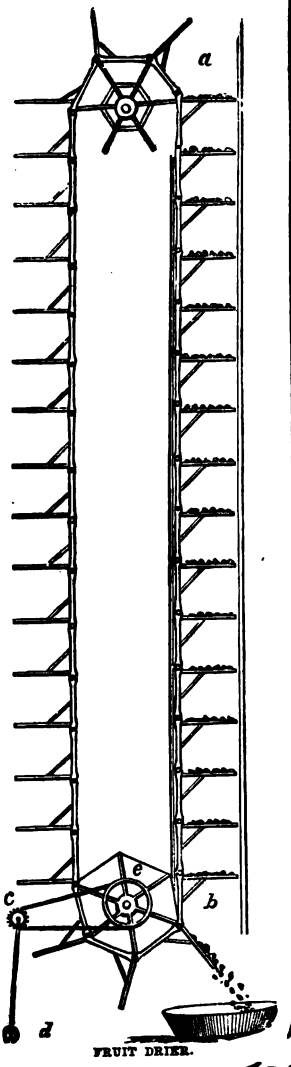
The *cast iron* pig-troughs are a great improvement on the common mode of construction of wood; they are indestructible by decay or the teeth of swine, easily kept clean, very portable, and always "right side up." The above figure, (fig. 3,) shows their form —their cost is about $1.50 each, made by J. L. Mott, of New York city.

The COUNTRY GENTLEMAN is *decidedly the best Agricultural publication* in the country, and is deservedly popular with all who take an interest in the successful cultivation of the soil. Its articles are written in a style that commends them to the practical farmer.—*Hudson Gaz.*

DRYING FRUIT.

It has been observed that the amount of peaches consumed in a single week in the city of New York, exceeds the total consumption of fruit in Great Britain throughout the entire year. The sales of perishable fruits are rapidly increasing throughout the country; but there is one serious drawback to their extensive cultivation,—that is the necessity of crowding them into market at the critical period of their maturity, so that twenty-four hours' delay shall not witness their destruction by decay and fermentation, and result in their total loss. Hence the immense superiority in this particular, of long-keeping sorts,—which may be deliberately secured and held in market for many months, till the best time shall be selected for their disposal.

But there is another important avenue to market for the perishable fruits that is at present almost unknown in its perfected form. We allude to *preservation by drying*. Every farmer *thinks* he has seen dried apples and peaches, *but not one in a thousand has seen them*—properly so called. That which usually appears under this name, consists in the first place, of a selection of such inferior, poor-flavored fruit, as can be used for nothing else;—this is imperfectly pared, leaving a due proportion of skin and core remaining, and is then variously subjected to partial decay, smoking, drying, &c., forming when completed a singular medley of all colors, from brown to nearly black, and with nearly as various an intermixture of flavors. Those who wish to see dried fruit in perfection, must remember that a poor-flavored sort before drying, can never by any ingenious process become finely flavored afterwards. The very finest varieties must therefore be first chosen. The process of drying must then be so rapid that no decay nor even discoloration shall take place until the operation is completed. Our climate is too precarious to think of drying fruit properly in the open air, even for the earliest varieties. Some artificial arrangement for the pur-



FRUIT DRIER.

pose must therefore be devised. The great leading defect of all the plans we have seen for drying by fire-heat, is *a want of circulation in the heated air*—a deficiency in rapid ventilation. A high temperature is given by means of stoves to a close apartment, the air of which in a few minutes is heavily charged with moisture from the fresh fruit, and a sort of steaming, stewing, half-baking process then commences, producing, after a long delay, an article far different from that of a perfectly dried, finely flavored fruit. A free circulation of air, kept dry by a continued fresh supply, would accomplish the work in far less time, and at a much lower temperature; and consequently retain in an incomparably more perfect manner the original characteristics and color of the fruit.

In order to make a beginning in this matter, and to assist in the erection of good, cheap, rapidly-operating, and perfect fruit-drying establishments, we present to our readers a figure and description of an apparatus for this purpose, which, although never patented, we believe to be far more valuable than many machines not thus thrown open to the public. Its peculiar advantages will be obvious as soon as the description is examined.

It consists of a tall upright shaft, *a b*, represented in the section of the apparatus on the preceding page, through which passes an endless chain, made of a number of strong frames, securely hinged together at their corners. This chain should be strong enough to bear several hundred pounds without breaking. At every joint it is furnished with a braced shelf, each consisting simply of a square frame furnished with coarse twine netting, like a sieve. This endless chain, with its series of sieves, runs over an angular wheel above and another below, precisely like those of a common chain-pump, but wide enough to receive the full breadth of the chain. Its motion is quite slow, descending from *a* to *b* on one side, and rising on the other, and is accurately regulated by means of the pendulum, *d*, connected to the notched wheel *c*, by means of an escapement like that of a common clock, but made very strong. A strong and broad India-rubber band connects the axle of this wheel to the drum, *e*, on which the chain runs. As the chain is loaded with the drying fruit, and is therefore quite heavy, it must not, and indeed cannot be subjected to the successive vibrations of the clock work—these vibrations being broken and destroyed by the India-rubber band.

The whole apparatus being ready for operation, heated air from a stove and drums, is made to pass up through the shaft, *a b*, being let in at the sides at *b*, and confined to this shaft by the drum, *e*, being made tight, and fitting closely without touching in its revolutions. A person with the freshly cut and pared fruit stations himself at *a*, and as each successive shelf or sieve slowly descends, spreads a single layer over them. They operate like the weight of a clock in keeping up the motion of the pendulum; and the velocity of their descent is accurately regulated by means of the relative sizes of the wheels placed on the axles of *c* and *e*, and also if necessary, by using different lengths for the pendulum rod.

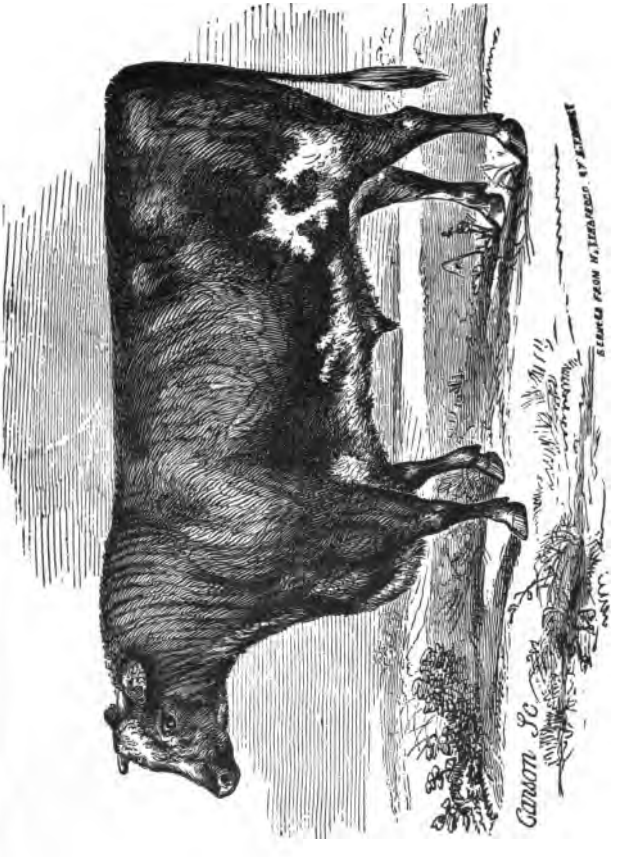
☞ The great advantage of this contrivance is the following: The dry and freshly heated air first enters the bottom of the shaft at *b*, and strikes the fruit when the drying process is nearly finished, and completes it; as this air rises, it receives additional portions of moisture from each successive shelf, until finally it passes off at the top,—the driest portions

being needed at the bottom, to complete the process, and those most charged with vapor only coming in contact with the freshest fruit at the top, where only it could be useful. The velocity must be so regulated, by experiment, (according to the height of the shaft, heat of the air, and time required for drying,) that the drying process shall be just completed by the time the fruit reaches the bottom, where it drops off from the revolving shelves into baskets or boxes placed there for this purpose. This apparatus may be placed in a tall, narrow building erected for the purpose, and built cheaply by vertical boarding on a wooden frame, to the whole of which a handsome architectural exterior may be imparted by giving it the aspect of a square Italian tower or campanile.

An apparatus of this sort will dry fruit with great rapidity, certainly, and independently of the most unfavorable changes in the weather; and it will come out white, clean, and perfectly dried, retaining all the peculiar flavor of the fresh fruit, and prove incomparably superior to the common, half-decayed, smoked, imperfect article. When known, such dried fruit must command almost any price in market. Drying establishments, well managed, would give a great impetus to peach planting in this country; and we unhesitatingly predict a large trade in the finest dried peaches in European markets, to which they can be so cheaply and safely conveyed, and where, as fresh peaches cannot be so easily obtained, they cannot fail to be very highly appreciated.

PAINTING IMPLEMENTS.

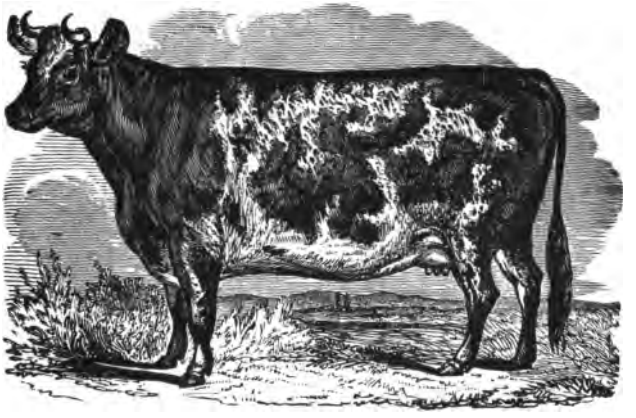
A great saving may be made by keeping implements constantly under shelter when not in use. But this is nearly impossible; and besides, many of them must of necessity be exposed during their employment, to many days of hot sun and occasional showers. It is therefore very important to keep them *well painted*. As a general average, they will last twice as long by the protection of a coat of paint, renewed as often as it is worn off. Now, only look at the economy of the thing—a harrow, horse-rake, or cultivator, may cost from five to ten dollars; a good coat of yellow ochre, renewed as often as worn off, would cost a fiftieth part of this sum, and would save its small cost many times over. Every good farmer has invested hundreds of dollars in his carts, wagons, sleds, plows, cultivators, rollers, harrows, rakes, wheelbarrows, spades, pitchforks, ladders, &c., and it will be much better for him to save a few hundreds in the course of ten years, by keeping a pot of paint always at hand, to apply to his washed or cleaned implements on some rainy day, than to try to make the same amount by seeking extra prices for his produce, by overreaching his neighbors, or by refusing a helping hand to the sick and destitute. We have mentioned *yellow ochre*—this is one of the cheapest paints, as well as the most durable, and being of a light color it will not absorb so much of the hot sun's rays as a darker color, and consequently will not cause heating, warping and cracking of the wood to which it is applied.



IMPROVED SHORT-HORN BULL.

IMPROVEMENT IN ANIMALS.

Skillful and money-making farmers have long since discovered the importance of selecting the best animals to stock their farms. A cow, productive in rich milk, costs but little if any more to keep than one that does not pay for her food; strong and active horses are far more

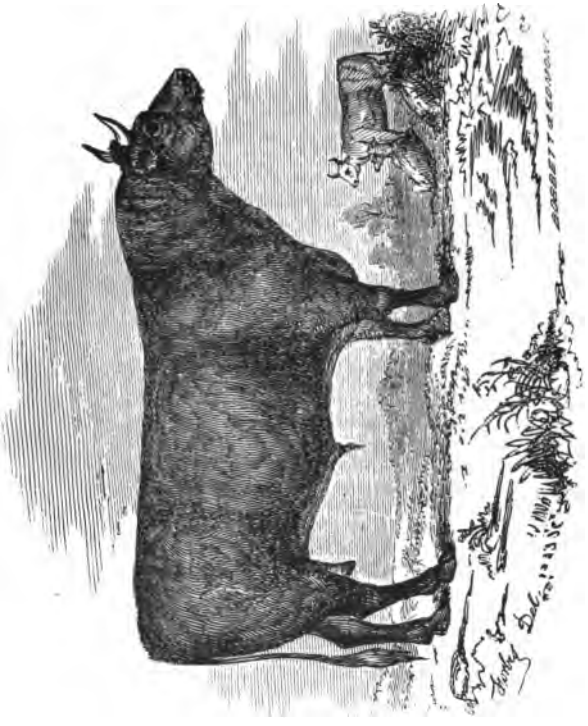


AYRSHIRE COW.

profitable than bad ones; a bushel of corn will make twice as much pork when fed to a Berkshire or a Suffolk, as to a Land-pike or Racer; and the best sheep will yield double the wool and bring triple the price of the poorer kinds. We have only space at present to point out some of the more prominent improvements that have been made in these particulars.

CATTLE.

By selecting the best of their animals to breed from, some skillful farmers have attained a degree of excellence in their stock, far in advance of their neighbors. In the same way skillful breeders, who have made the business a study for their lives, have succeeded in raising animals so much superior to all others in some particular points, that these animals have become the origin of what are termed *new breeds*. The finest Short-horns, Herefords, Ayrshires, and Devons, not only stand out from the mixed herds of the country, with peculiar and fixed characteristics, but their *excellence is preserved* only by a degree of the *same skillful management* that first rendered them celebrated. There are but few farmers therefore that can expect to attain eminence as successful raisers of these animals on the long run; but all may avail themselves of the advantages by procuring a good bull of one of these sorts, either for a large farm or a neighborhood, and infusing their blood into the very best native cattle



DEVON BULL.

The improved SHORT-HORN or DURHAM breed, (see fig. on p. 84,) possesses eminent advantages for large size and quick growth; hence the half-bloods are generally large, handsome animals, that sell well for beef. Some of the Short-horns are also excellent milkers; we have never known better cows for milk and butter than some grade cows of this class. But breeders have given great attention to *handsome form*, too much to the exclusion of high milking qualities; for this reason it is only occasionally that great milkers are to be found among them. This remark applies to breeding cattle generally, when *form* is considered the criterion of excellence. Those who procure bulls for the improvement of their stock, should endeavor to ascertain their character for other qualities as well as form; and especially should they employ the very best milkers only for raising calves, if the dairy is the object. The AYRSHIRE breed, (see fig. on p. 85,) are smaller than the Durham, but

ALDERNEY COW.

celebrated for their milking qualities. They have not yet been so extensively introduced into this country as to admit a fair trial of their comparative excellence in this particular. The DEVONS are remarkable for their neatness of form, (see fig. on p. 86,) and fine dark reddish brown color. Some of them are good milkers, but in general their milk is more characterized for its richness than quantity. This breed, and more particularly its crosses, furnish some of the finest working oxen. The ALDERNEY breed are famed for three qualities,—(see figure above,) for producing exceedingly rich milk, for their smallness of size, and destitution of beauty of form. They are voracious feeders. Although the quantity of milk they produce is never large, yet from its surpassing richness, they often yield large quantities of butter, one instance being on record where *nineteen* pounds were yielded per week by one animal for three successive weeks. This breed has been lately much improved in the island of Jersey, both in form and excellence, our figure representing one of the improved sort

HEREFORD OX

The HEREFORDS, (see figure above,) contain a combination of several excellent qualities, although not in so high a degree as those particular qualities are separately exhibited in some other breeds. They have not been extensively introduced here, although there are some excellent herds in the country. They are fine draught cattle.

HORSES.

Now that railroads are so extensively introduced, horses are rarely wanted for long journeys, but the demand for good ones has rather increased for all other purposes. For driving single day jaunts on the road, drawing loads to market, and working on the farm, the increase in business has called for an increased supply. The great and general improvement throughout the country, in facilities for business, has opened the eyes of enterprising men, and they cannot be satisfied with driving and using the inferior animals of past years. For this reason, *good* horses are likely

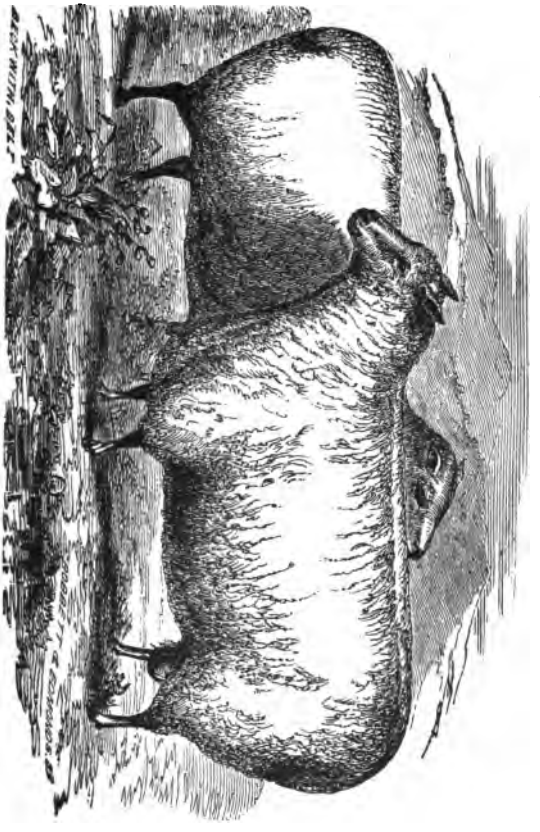
BLACK HAWK

ENGLISH CART HORSE.

to command a high price for a long time to come, and farmers will find it to their advantage to avail themselves of the very best to breed from. The same general remarks that we have made on breeding cattle, apply here also, and we need not dwell longer on this branch of the subject.

We have not space to point out the different kinds that have been introduced; farmers will examine for themselves and ascertain those which promise from past experience, to stamp the most valuable qualities upon their offspring. We may however briefly allude to the MORGAN race, (of which see portrait on p. 89,) which has a high reputation for activity and general value, and for the uniform excellence of the colts which have been produced by this breed. There are several other improved races of high character and value.

The English DRAUGHT HORSE, (see figure above,) is remarkable for its



LONG WOOLLD SHEEP.

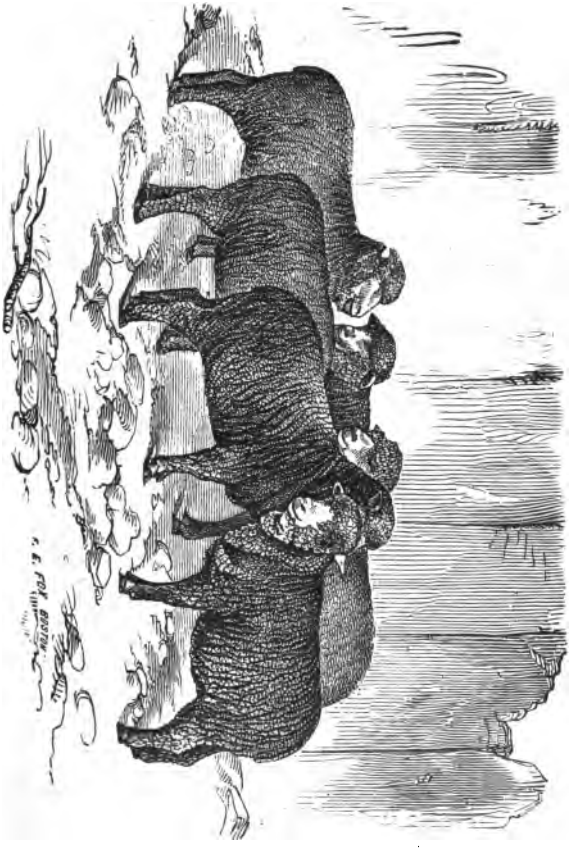
surpassing strength, and although useless for driving on the road, would perhaps prove valuable for plowing and heavy carting on large farms, where a team might be kept especially for these purposes; and they would no doubt be well adapted to the labor on our public works. We have known one that would draw a ton, besides the cart, on one of our poor muddy roads, with great ease; and its owner offered to let him draw against any *pair* of oxen, but found none to accept his offer.

SOUTH DOWNS.

SHEEP.

As specimens of some of the improved sheep which are becoming introduced through the countrywe present the accompanying portraits, (see p. 91,) of a long wooled ram and ewes, which received the first premium in this class from the New-York State Agricultural Society three years since, and of *South Down* ewes, which were likewise premium animals. These breeds, and especially the South Down, are remarkable for the excellence of the mutton they afford, and for the great beauty of the animals. (See figure above.)

The accompanying figure is a fair representation of the large *French Merino* breed (see fig. on p. 94,) and is an accurate portrait of the ram owned by Jewett & Morse, known by the name of "Ten Thousand," and which, when a yearling, weighed 224 pounds. We measured a full grown animal of this breed, whose head was a foot long, and from the



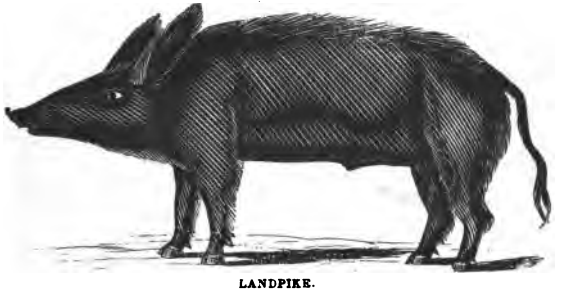
SPANISH MERINOS.

FRENCH MERINO.

tip of his nose to the beginning of his tail was plump *six feet*. Whether such large animals would be as convenient to handle as those a little smaller, may be a question. The cut on p. 93, represents a group of *Spanish Merino* ewes (from a daguerreotype) which are a smaller breed, the ewes weighing eighty to one hundred pounds and the rams a hundred and twenty-five to one hundred and fifty pounds. This is one of the most profitable kinds of sheep for wool growing, perhaps the most so for general use.

SWINE.

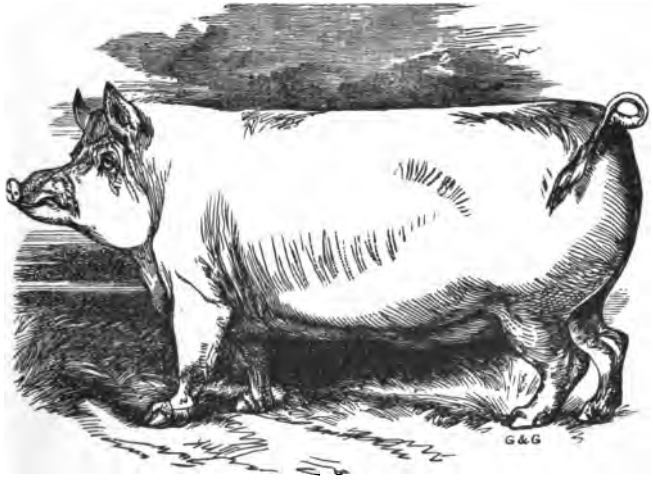
In raising animals of whatever kind, the best animals are important, but none are more so than the best swine. The Racer or Landpike



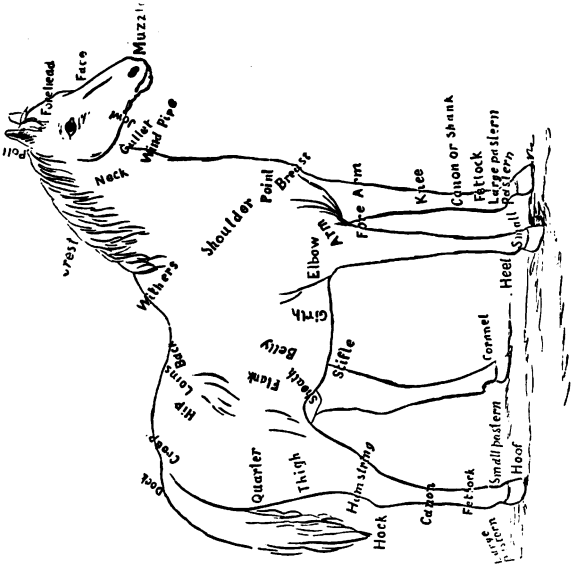
LANDPIKE.

ESSEX.

breed, for instance, (see fig. on p. 94,) will consume an almost endless amount of corn or other food, and afford little else than gristle in return; while such fine animals as the BERKSHIRE, the ESSEX, (see above figure,) or the SUFFOLK, (see fig. below,) can be hardly kept from becoming fat under any circumstances, and with good feed will afford the most profitable return in an abundance of the best pork. The two last named breeds have at present the highest reputation of any, among intelligent pork raisers.



SUFFOLK.

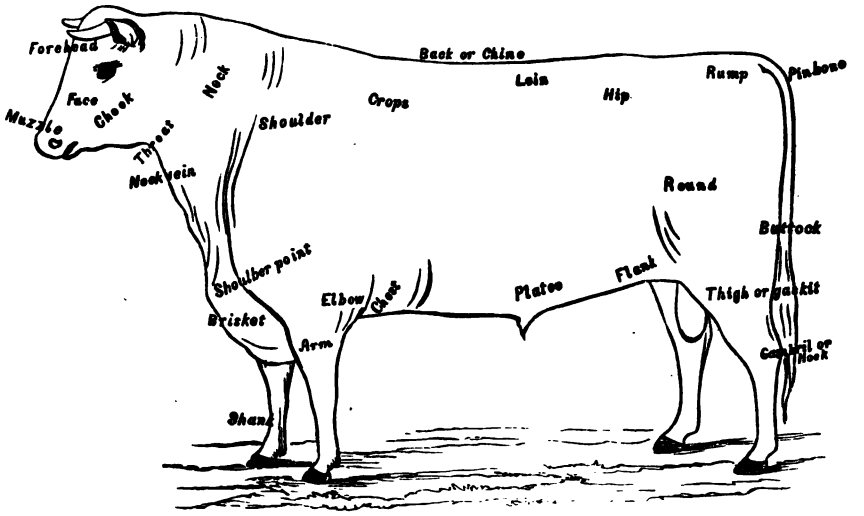


Section of a Horse's Foot.

COMMON TERMS DENOTING EXTERNAL PARTS OF ANIMALS

For the benefit and interest of our young readers, we give in the annexed figures an explanation of the more common English terms used in describing the external parts of horses and cattle. The names being placed upon the parts designated, the impression is vividly and distinctly made through the eye, in a better manner than by the usual mode of references.

The structure of a horse's foot, which every one who owns a horse should understand, is distinctly exhibited in the above figure.



Explanation of English Terms used in Describing the External Parts of Cattle.

HEAVES IN HORSES.

The following account of "How I bought a Horse that had the Heaves, and how I treated that Disease," was furnished some time since for the columns of the Country Gentleman, by HENRY F. FRENCH, Esq., of Exeter, N. H. The spirited style in which it is narrated will give double effect to the lesson it teaches. Though extensively copied at the time of its publication, we think it well worthy of a wider circulation, as well as a convenient form for frequent reading.

MR. EDITOR—Did you ever read "The Adventures of a Gentleman in Search of a Horse?" I read it years ago, and have never been so fortunate as to see it since. *If* I recollect aright, it gives the experience of a man, who set out to purchase a perfect horse, and with about the same success that King Solomon had in trying to find a perfect woman; and tells how he, like all the rest of us, got cheated again and again, in different ways, as the *best of people will*, and indeed are more likely to be than anybody else. Once he bought a fine animal that was advertised, as "*sold for no fault, only the owner wants to leave town*," and the new proprietor was led to feel the full force of the language, the first time *he* wanted to leave town, for his new steed could not be induced by any suasion, moral or physical, to budge a single rod from his stable door.

Perhaps it was not *that* gentleman, but another, who having purchased a nag, which was represented as *free from all faults*, and found him stone *blind*, brought him back to the seller, and reminded him of his statement.

"I hope," replied the seller coolly, "you don't call blindness a *fault*, when it is only the poor horse's *misfortune!*"

Everybody knows that I have no great pretensions to much knowledge about horses, and in order, therefore, to give my teachings due weight, you must be informed how I came by my education in this department of science. Be it known, then, that about five years ago, I chanced to be the proprietor of a mare, the veriest vixen that ever went on four feet. Among her other "amiable weaknesses," was a strange propensity to *kick*. It was her favorite amusement to kick at any other creature, quadruped or biped, that came within reach; and when tied alone, she would keep herself in practice by kicking up her heels, as high as the scaffold, about once in five minutes, accompanying the performance with a squeal, that could be heard by all the neighbors.

Such an animal was rather difficult to dispose of, as you may suppose. Mr. Pickwick and his friend, after they had led that "dreadful horse" six miles in the heat and dust of a summer's day, without being able to mount him, were in a scarcely worse dilemma. Finally, my precious Kate, who was more of a "shrew" than even Petruchio's, having withstood most manfully (*womanfully* occurred to me, but I won't say it,) all my endeavors to "tame" her, commenced a new species of gymnastics, by kicking up in the carriage every time she felt the breeching in going down hill.

Now, as she would not work on the farm "for any man's persuasion," and was not precisely the kind of animal to sell to one's particular friend as "a steady family horse," and as I did not dare to risk my own wife and children behind her, I began to read the "Muck Manual," with the idea of com-

puting her agricultural value for the compost heap, when fortunately I had occasion to drive her to the good old town of Derry in a sleigh. As I came up to Cameron's Hotel, at about "a three minute lick," as the jockeys say, I saw at the sign-post, a fine stately horse harnessed to a sleigh. I was examining him pretty carefully, when a man whose appearance announced him as one of "the Fancy," stepped out, and accosted me with, "Well, friend, do you want to buy such a horse as that?" "I should like him," was my reply, "if he is as good as he looks, and you will sell him at a fair price, and take mine without any extra charge."

"Why, what sort of a beast have you got? She looks well, and came up the street as if she had legs enough."

I hope I shall be forgiven, if I suspected he would not believe more than half I said, when I replied, giving him the literal truth: "She is six years old, and sound, can trot a mile in three minutes, and will be likely to kick your brains out if you take her, in the course of a week." He assured me that *his* horse was perfectly sound and kind; that his price was three hundred dollars, and that he would "swap right;" adding, coolly, "I should like to see one horse that is uglier than *I* am."

I proposed to drive his horse, alone, to which the owner at once assented, and I steered straight off to the stable of a man, famous for his skill in horse-flesh, whom I had known when I was a boy there at Pinkerton Academy, and asked him to examine the animal with me. We drove him out of sight, and gave him a thorough investigation. We tried him in all his paces, walk, trot and canter, forward and backward, examined his teeth, his feet, his knees, his eyes. We observed his breathing, spoke of the glanders, the heaves, broken wind, and various other ills which horse-flesh is heir to. But he seemed "all right." He was young, and large, and handsome, and fleet, and to all appearance sound and manageable; and yet we were perfectly satisfied that the horse had some defect.

However, I put a bold face on the matter, drove back to the hotel, and told my man I would give him fifty dollars to boot, or go along with my own horse. Without driving my mare an inch, he quietly unhitched his own horse from his sleigh, exchanged harness, put him to my sleigh, and pocketed his fifty dollars, hardly losing a whiff of the cigar he was smoking. I confess I was a little startled at his perfect composure, but with a friendly caution to beware of Kate's heels, I bade him farewell.

I had but five miles to drive that afternoon, to my native town of Chester, where I stabled my new horse for the night. I gave him the name of the "General," it being a time of political excitement, when both candidates bore that title. I never mingle politics with agriculture, and did not want my horse to run a political course.

Having dreamed of horses all night, besides having the *nightmare* once or twice, I awoke betimes, anxious to learn the condition of my new treasure. Everybody knows how much more pride one feels in his horse, than in any other property, and especially how it "takes the conceit out of him" to be cheated in a "horse trade."

I went to the stable with fear and trembling, doubting whether the *General* had not been transformed like "fairy gold," to dust and ashes, during the night, or whether he might not have been a witch's horse, and be found turned into a broomstick!

But he was there in full shape and proportions. *He gave a slight cough* as I opened the door, a sound which a man who has owned a horse with the heaves never will forget! and on examination I found he had a strange way of breathing, *his flank heaving two or three times* at every expiration of the breath. I was told at once that my horse had the *heaves*.

I had heard of the disease frequently, and had the impression, which I find is quite common, that it renders the animal worthless. However, as it was a complaint which struck at my purse and my feelings, and not like Katy's heels, at my *head*, I concluded to be resigned, and avail myself of my very manifest advantages for observations on its symptoms and treatment.

My horse went home to Exeter, sixteen miles, in fine style, with no symptom of disease, except once in a mile or two, a slight cough. Straightway I strove to learn all that books and stable men can tell of the heaves, and to try all known remedies.

In its common form it is thought to be a formation of air cells on the *outside* of the lungs, from which the air escapes with difficulty. Sometimes, on dissection, the proper air cells of the lungs are found to be ruptured, and generally there is inflammation of the throat and windpipe. The theories about it are various. It is said often that the lungs have not room for action, and that food should therefore be given in a condensed form, and in moderate quantity—and this I should regard as correct, were it not notorious that horses at grass, where they eat enormously, and keep their stomachs distended, are usually relieved of their worst symptoms.

I tried all sorts of *heave powders* on my patient, with no effect whatever. It is said that in a *limestone* country this disease is unknown, and lime water was prescribed, with no apparent advantage. Some one told me to give the horse *ginger*, and strange to tell, I found that a tablespoonful of ginger given to the General with his oats, when breathing his worst, would cure him *for the day*, in half an hour after he had eaten it; but on giving it daily, the effect soon ceased. It is a jockey's remedy, and will last long enough to *swap* upon. Finally, I was advised to cut my horse's fodder, and give it always wet. I pursued that course carefully, keeping the General tied with so short a halter that he could not eat his bedding, giving him chopped hay and meal three times a day, and never more than a bucket of water at a time.

He improved rapidly. I have kept him five years, making him a *factotum*—carriage horse, saddle horse, plow and cart horse—and he bids fair to remain useful for five years to come. Kept in this way, his disease does not lessen his value for speed or labor, a single dollar. When the boys grow careless, and give him dry hay, he informs me of it in a few days by the peculiar cough I have mentioned; but sometimes, for six months together, no indication of disease is visible, and he would pass for a sound horse with the most knowing in such matters. There is no doubt that *clover hay*, probably because of its *dust*, often induces the heaves. Stable keepers with us, refuse it altogether, for this reason.

Many suppose that the *wind* of the the horse is affected by the heaves, so that fast driving at any time will, as we express it, put him out of breath. With my horse, it is not so.

When the General was at the worst, rapid driving, when just from the stable, would increase his difficulty, but a mile or two of moderate exercise would dissipate the symptoms entirely. We have occasionally, what are called *wind-broken* horses, which are nearly worthless for want of *wind*. They can never be driven rapidly without great distress, and frequently give out entirely by a few miles' driving. This is thought to be a different disease. The General's case is, I suppose, a fair example of the *heaves*.

I have no doubt that *regular feeding with chopped and wet fodder*, and exclusion of dust from hay fed to other animals in the same stable, would render many horses now deemed almost worthless, and which manifestly endure great suffering, equally valuable for most purposes, with those that are sound.

And now, my dear sir, if you will call on me when the snow has gone, and the birds begin to sing, I will show you the General, fat and sleek. I shall be glad, also, to show the *country gentlemen* of our neighborhood, one whom they already know by his works, as a man who has done much to make the earth fruitful and beautiful, and to enhance the enjoyments of Rural Life.

IMPROVED FARM MANAGEMENT.

It is a subject worthy of inquiry, why some farmers, with only moderate means and with the growth of no extraordinary crops, make handsome yearly profits, while others with equal or superior means, and often perhaps with larger products in certain cases, accomplish little or nothing as an aggregate gain. The answer to this problem will doubtless be afforded by the superior management in the arrangement of the complex machinery, in conducting the multifarious work of the farm. We believe that a bird's eye view of an entire year's operation, would often greatly assist the farmer in his farm arrangements, and perhaps a few very brief suggestions may afford some valuable assistance in accomplishing this purpose.

The first great object in all farming, is, of course, to obtain from a given quantity of land, the largest product with the least outlay or consumption of capital. To secure this result, the following points should be attended to:

1. The land must be in such a condition as to admit of working at all times, or nearly so, so that men and teams may not be standing idle, in waiting for the land to acquire a suitable degree of dryness. Hence, if naturally wet, it must be well under-drained.

2. Its condition should be such as to admit of the application of manure to good advantage, by thorough intermixture and otherwise—and not to render it useless by being enveloped with water or water-soaked earth.

3. A high degree of fertility should be maintained—as the same labor in that case will yield a larger result.

4. A thorough eradication of weeds and their seeds, will save much subsequent labor in contending against them, as well as save much of the fertility of the soil from waste in their useless growth.

5. A saving of the materials of manure should be carefully attended to, as one-half at least of the solid and liquid portions are usually wasted by a neglect to provide absorbents or reservoirs.

6. Selecting crops, and selecting a proper proportion of each, is of the highest consequence. The market value of one crop may be higher than that of another, but if it draws hard on the strength of the soil, or costs much labor, or if the labor required be at a time when there are other important drafts upon it, such a crop should not be often repeated.

7. Everything should be done as cheaply as possible, for which purpose crops should be arranged so as to distribute the labor equally through the year, that men and teams may not be idle at one period, and hardly driven at another, or in other words, that too much business may not at times accumulate for its thorough completion in season. It frequently happens that the difference between profit and loss depends on this alone.

8. Nothing is more important than the distribution of crops in a rotation, as they exhaust the soil differently, or what one takes from the land, another leaves; hence the greater variety of farm products, the more perfectly the balance will be maintained in the soil. For example, wheat, barley and oats, are regarded as silica plants, or those which consume more largely the soluble flinty portions; peas, beans and clover, are lime plants; potatoes and turneps are potash plants; these different classes should be distributed so as to preserve the ingredients of the soil, if we may use the term, in equilibrium. To preserve, also, a clean state of land, sowed and hoed crops should alternate with each other.

9. A system comprising a proper intermixture of tillage and grass crops and raising domestic animals, should be carefully made out and adopted. Grain crops often afford the highest immediate profit, but domestic animals serve the indispensable purpose of supplying manure; hence in estimating the profit of raising and fattening cattle, sheep and swine, the very important means they serve in providing pabulum for tillage crops, should be carefully taken into account, a thing too often thrown entirely out of the question.

We briefly mention these different points in successful farming, not as anything new, but for the purpose of recalling the attention of farmers, who, by careful observation and accurate records, can arrange the details of adjusting their own operations, better than by any particular rules we could lay down for their guidance.

ROTATION OF CROPS.

It is surprising how much more some men will accomplish by dint of good management and shrewd thinking, than others will by hard and laborious toil. A good story is told of a "backwoods" farmer, in whose fields the stumps and his crops held each a sort of doubtful jurisdiction, and who was very much annoyed by the difficulties in contending with these stubborn representatives of the original forest-oaks. His boys complained much of the annoyances they met with in plowing and harrowing—the old-fashioned drag especially gave them great trouble, by its constant overturning while plunging among the stumps; once in

each ten yards of the traveling, on an average, they were obliged to stop and place it "right side up." "Boys!" said the father one day, when his patience had become exhausted, "take that harrow over to Hammerwell, the blacksmith, and tell him to make the teeth all twice their present length and shape at both ends, and we shall see what we can do!" It was accordingly done, and the harrow came back with its teeth as surely pointing both directions as those of a revolving horse-rake. "Now, boys, we will try the new harrow," and it was accordingly set in motion. "Why, father," soon exclaimed one of the sons, "it has upset again, just as bad as before!" "Never mind, go right on without stopping, it will work either side up." The difficulty was conquered; and the harrowing was speedily accomplished, and without the innumerable delays of "righting the ship."

We have seen some very industrious and worthy farmers whose labors we could not help comparing with this continued toil with the harrow; and others, again, whose skillful management was fully equal to the double acting, double-toothed pulverizer. And in nothing was this difference more visibly exemplified than in the arrangement and ROTATION OF CROPS.

There are other very important requisites in good farming, but they are all accomplished with an increase of expenditure and labor. Manuring, for example, is a most powerful means for improvement; but both manures and their application are expensive in proportion to the amount applied. Underdraining has wrought wonderful results, but the cost is always a large item, and the same may be said in some degree of deep plowing and subsoiling. But in the arrangement of a rotation, no additional expenditure or labor is necessary; it costs no more to cultivate crops which are made to succeed each other judiciously, than to cultivate those arranged in the worst manner possible. The former may bring triple the successful results of the latter—not by the expenditure of five hundred extra days in drawing manure, or five hundred dollars worth of ditching; but simply by making a proper use of one's brains.

It most fortunately happens that no extraordinary originality, shrewdness, or profound wisdom is needed to render available all the advantages of a well devised rotation. The full experience of others is furnished directly to our hands, in the excellent practical publications which have appeared on this subject; and all we have to do is to make use of the materials right before us. It seems surprising, under the circumstances, that so small a number seize the golden prize thus completely placed within their reach—that there are so few, even of those reckoned good farmers, who pursue anything like a systematic succession, to say nothing of such a rotation that shall accomplish its peculiarly beneficial results, namely, preservation of the riches of the soil, destruction of weeds, destruction of insects, and the most advantageous consumption by each successive crop of all the means for its growth within reach. As a consequence of this neglect, we see land overcropped with wheat, the soil worn out for this particular grain, and those troublesome weeds, chess and red-root, taking its place. We see pastures, left unplowed for a long series of years, become filled with "buttercups" and oxeye daisy. A disproportion of spring crops facilitates the spread of wild mustard, and among insects, grubs and wire worms increase according to the cultivation that favors their labors. It appears to be but little understood how great

is the assistance to clean cultivation afforded by a good rotation. The best example of this sort we ever witnessed, where every field of the symmetrically laid-out farm except a wet meadow, was brought under a regular unvarying system, scarcely a weed was ever to be seen; and we ascertained that not one-third of the labor usually expended, was required for the hand dressing of hoed crops. The alternation was such that the whole operated like the two-faced harrow—the culture of each successive crop constantly tended to the destruction of some weed injurious to another, and thus all were destroyed in their respective turns; while at the same time the fertility of the land was increased and each crop fed with its own proper nutriment as its turn came round.

Systems of rotation must vary according to the nature of the soil in different regions of country, the amount and kind of manure at command, the cleanness of the land, the nature of the market, and the proper distribution of labor. One of the best farmers we have known, had his farm laid out in equal fields, and adopted the following rotation:

1st year—Wheat after clover.
2d " Corn, potatoes and ruta bagas, with all the manure made that year.
3d " Barley.
4th " Wheat, seeded with clover.
5th " Clover pastured.

A piece of low ground was kept for meadow, and was occasionally top-dressed, and rarely broken up and reseeded. A rougher portion of the farm was occupied with summer-fallow, wheat, clover, and grass for pasture. This farm was a strong fertile soil;—poorer land would need a longer season in grass, which would admit a larger number of live stock, and as a consequence produce a greater amount of manure.

The following may be adopted, with variations according to circumstances:

THREE COURSE SYSTEM.

1. Corn and roots, well manured.
2. Wheat.
3. Clover—one or more years, according to fertility and amount of manure at hand.

FOUR COURSE SYSTEM.

1. Corn and roots, with all the manure.
2. Barley, or peas, or both.
3. Wheat.
4. Clover—one or more years.

Oats are always a severe crop, and an excellent farmer of our acquaintance who adopts the above, never permits oats to grow on good wheat land, but confines the crop to the more moist portions of his farm, adapted only to this and to meadow and pasture.

THE COUNTRY GENTLEMAN is, to our mind, *the best* agricultural paper in the country.—*Oneida Tel.*

On all maters pertaining to the occupations of the Farmer, the Grazier, and the Horticulturist, as well as to Domestic Architecture, and the Country Fireside, THE COUNTRY GENTLEMAN is without a rival.—*Winsted Herald.*

LAYING OUT FARMS.

We have many volumes of instructions and illustrations to show us how to plan and build our houses; but not one on laying-out farms. Is it because fences cost less than dwellings? This cannot be; for let any one who occupies a hundred acres, well fenced, but make the estimate, and he will find that he is compelled to keep up, even on this small domain, no less than four miles of partition walls between his fields, and the cost, with repairs, to be quite equal to that of a good farm-house. Is it because easy access to all parts of a farm is not essential to good husbandry? Can the farmer travel more easily a needless furlong, than the housewife can take five unnecessary steps from the kitchen to the dining-room? Is it easier for the farmer to draw a load of manure over a hill fifty feet high, or through a mudhole a foot and a half deep, than his partner within doors to descend and return from that nuisance in domestic arrangement, a cellar kitchen? A moment's reflection must show that a well planned sub-division of a farm lies at the very foundation of convenience, system and economy.

Let the reader carry out in figures the actual yearly cost of a single awkward defect. To drive a herd of cows a half mile between the barn-yard and pasture, may seem a slight task; but when it is repeated four times daily for 8 months of the year, the aggregate distance to be traveled, is greater than from Buffalo to the Atlantic; and not performed as the latter is with fire-car and the tempest's speed, but with the toilsome labor of the pedestrian or drover. A slight improvement in the plan might perhaps easily lessen this journey a hundred miles. When therefore the whole amount of other farm traveling is taken into consideration, with loaded carts and without them, the subject of arrangement becomes one of no mean importance.

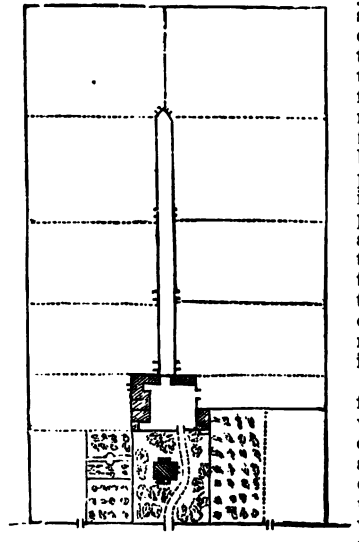


FIG. 1.

In furnishing specimen plans for laying-out farms, a difficulty will suggest itself, namely, the endless variation in their interior and exterior forms, in the position of hills and valleys, marsh and upland, in woods, springs, and water courses, and in the intersections by the public road. This difficulty will however be greatly reduced, by adopting a few general plans with the leading principles, which may be modified according to circumstances.

The most simple piece of ground, and the most easily laid out, is the nearly level parallelogram. There are many such in the country, and when the size is moderate, they usually lie with a narrow end to the public road. Such a one may be easily laid out into fields as shown in the preceding figure, (fig. 1,) where every field is entered from the common lane, and the operations in each kept entirely separate from all the rest. The boundary fences, and those forming the lane, are permanent; the others may be movable, to vary the size of the fields, or to bring every portion of the farm into occasional cultivation. The smaller divisions, for garden, calf-pasture, hog-yard, &c., are placed near the buildings. This is perhaps the simplest mode of properly sub-dividing a farm, and with some slight variations will apply to a large portion of those of more moderate size. We furnish a single instance of a modification to suit a farm of uneven surface. Suppose, for example, that at the field A, there is a high and broad hill, extending nearly across to the opposite boundary; and at B there is another hill, stretching as far in the other direction. A valley will be thus formed from C to D. Fig. 2 exhibits the form of the first plan varied to apply to this piece of ground. To avoid going over the first hill, the lane bends so as nearly to pass round it, rising however gradually as it extends backward, until at E it crosses the valley, and continues to rise by a moderate ascent to its termination. A bridge and embankment are made at the crossing, the cost of which will be according to the means of the proprietor, and also adapted to the amount of cartage across it.

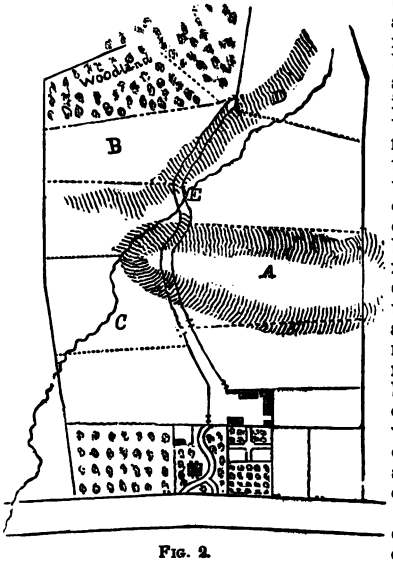


Fig. 2.

Here, some one who prefers driving a load up hill and down hill three hundred times in the year, to spoiling a pretty plan *on paper*, exclains, "How crooked! How distorted! I want all my fields with straight boundaries—and no crooked lanes running through my land." Such a farmer would have no deflections in the public roads to avoid mounds or gulfs, but would prefer mounting right over a hill a hundred feet high, to bending a hundred feet to the right or left, for a level. To such an one these remarks are not addressed, but to those only who prefer to make all their flexures in a horizontal plane, rather than in a perpendicular one. We have indeed seen those who for years had drawn in all their farm crops, and returned all their manure, over a laborious ascent and down an incon-

venient plunge, and we could not help wishing that they might at least make a short trial of a few easy curves with a fine level road, even though the beauty of the plantation, as seen from a balloon above, might be somewhat diminished.

Large farms usually border the public road for a greater breadth than smaller ones, and hence a different arrangement becomes necessary. The annexed plan, (fig. 3,) represents one of this sort, with the disposition of the farm-road and fields. The two extreme fields adjoining the public road, are entered as in the first plan from the latter.

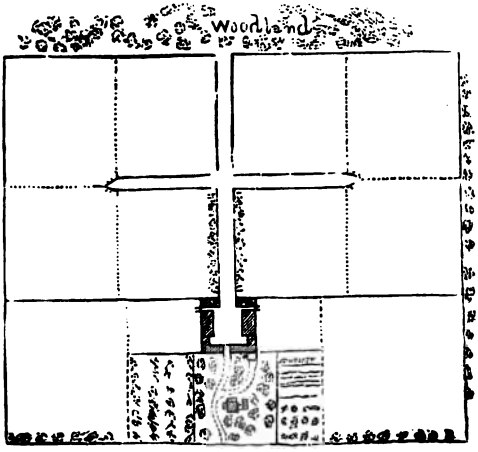


FIG. 3.

This subject might be very easily extended to an indefinite length, but we close with a few general rules, which if borne in mind, would be of essential use in planning the subdivisions of every farm:

1. The farm road or lane should be as short as possible in connecting the fields with the buildings. If *much used*, the *form* of the fields if needed, should be made to conform to this requisite, and to its levelness.

2. The barn and other farm buildings should be as near as practicable to the center of the arable land, for economy and expedition in the cartage of manure and crops; at the same time that access to the public road should not be forgotten.

3. The number of fields should be accommodated to the system of rotation established on the farm, and should therefore be as nearly as may be of equal size.

4. The fields should be made nearly square, for economy of fencing material and to save occupancy of land by boundaries, less being needed for a square than for any other rectangular form.

5. When the land varies greatly in character, as in wetness or dryness, &c., such as is most similar should be brought within the same boundary, to be subjected to the same treatment in rotation. Dissimilar fields may however be often rendered alike by draining and subsoiling, when not otherwise easily subjected to a regular system.

6. Bringing streams of water alongside the fences, rendering facilities for irrigation, and also supplying water to each field, should not be overlooked.

7. Hills should be brought near the center of fields, to enable the

plow to pass around them to throw the earth downwards from the mould-board.

8. The area of each field should be determined, to enable the farmer to judge of the requisite quantity of seed and manure—and to measure the amount of crops, and time required for mowing reaping plowing &c.

HOW YOUNG FARMERS MAY PRACTICE ECONOMY.

"I am not *rich enough* to be economical," said a young friend of ours, when we strongly recommended to him the profits of a certain improvement. "The want of means compels me to work constantly to a disadvantage, and I cannot enjoy the privileges and profits of my richer neighbors." This is a difficulty in which many intelligent farmers have found themselves placed, and from which they would most gladly be extricated. Innumerable instances are occurring in their daily practice, where they could secure golden results, had they only the lever of capital placed in their hands; but as they are now situated, they seem to themselves like the man who is digging the earth with his unassisted hands, or the one who is compelled to carry water in an egg-shell, while their more fortunate neighbors are turning up the deep soil with the most perfect instruments, or sending streams of refreshment and fertility over their entire farms. Now, we are not about to plan a "royal road" of escape from this difficulty; it must be met and conquered. If the attack is rightly made, the conquest will be comparatively easy; if wrongly, it will be the discouraging and formidable task of a life-time.

The eager inquiry is now made, What is the easiest mode of conquest? We answer, the first and great leading means, is a large fund of thorough and practical *knowledge*. The man who, by a close observation of results in his own practice and in the experience of others, in connection with the immense amount of useful *suggestions*, (to say nothing of distinct practical directions) contained in the best publications of the day, possesses, even with a very short purse, a vast advantage over the short-sighted, ignorant, and unobservant capitalist. He will turn to advantage, even with his very limited means, a thousand resources which others would allow to sleep unemployed forever.

We once had occasion to observe the contrast in the condition of two young farmers, one of whom had a four hundred acre farm "left" to him; the other had but fifty acres, which he had paid for in part, by previously laboring on a farm some years by the month in summer, and teaching a district school in winter. The one had the capital of money which his own hands had never earned; the other possessed the more valuable capital of knowledge and indomitable perseverance. The young heir was more interested in riding about, in parties, balls, and in jaunts to the city, than in the details of farming, and knew the contents of the tri-weekly political newspaper, and of a certain frivolous magazine, much better than of any agricultural journal, or of Norton's Elements. His farm became an exact reflection of his own character. Fences were soon obscured by belts of alders, blackberries and burdocks,

and buildings showed marks of premature age, and became dilapidated. There was a thirty-acre marsh, which might have been drained, but it never was. And there was a patch of Canada thistles which filled one twelve-acre field, and part of another, which he could have destroyed in one season, had he known how others had done. One hundred and eighty loads of manure, as estimated at any one time by a neighbor, were allowed to lie a whole year about his barn, without application. His cattle were of the long-horned, big-headed, sharp-backed breed. His swine were the Long-bristled Racers. His profits in farming may be easily guessed. There was a general complaint among his neighbors, that his debts were never met within six months after the appointed pay-day, and that he endured a sharp dun with extraordinary patience. It is true, necessity drove him to retrench his expenses, and the improved examples about him induced him to amend his practice, but not until his farm was reduced to less than half its original size, by portions sold off at three different times to satisfy mortgages.

Well, what become of the young fifty-acre farmer, we are asked. He has ceased to be a "fifty-acre farmer." He began by examining closely what improvements could be made of whatever character and kind, whether cheap or expensive. Among these he was compelled to select first the cheap improvements, or those which promised the largest profits for the smallest outlay. One of the first of these was the draining of a three-acre alder swamp, a large portion of which he did with his own hands in autumn, between seeding and husking. He had read of Judge BUEL's success with *brush drains;* he constructed all the side or secondary channels by filling them at the bottom with the brushes cut from the ground, which enabled him to accomplish the work at less than half the usual price. These brush drains have now stood many years, and the brush being wholly excluded from the external air, has not decayed, and they carry off the little water required, being numerous, and at regular intervals. Now, observe the result: The alder swamp would not have sold originally for five dollars an acre; it now brings crops of corn, broom-corn and meadow grass, more than paying the interest on a hundred and fifty dollars per acre, besides all expenses. He doubled his manure by drawing from the most peaty portion of this drained swamp, large quantities of muck to his farm-yard, where it was kept comparatively dry till wanted, under a cheap slab and straw shed. By paying a small sum yearly, he was enabled to improve immensely the breed of his cattle, sheep and swine, and which he thinks has returned the money thus expended at least twenty-fold. The same keen attention to his business in other points, enabled him to effect many additional improvements, among which we may briefly mention a cheap and simple horse-power of his own construction, consisting of a rope running on the ends of radiating arms, which enabled him by means of one or two horses, as necessity required, to thresh his grain, saw his wood, drive his churn, turn his grind-stone, and slit picket-lath. It is true, he has now thrown this rude machine aside for the greatly improved endless-chain power, but it answered his purpose for the time, before the days of improved machinery. But among all his outlays for the sake of economy, there is none which he thinks has repaid him equal to the subscription money applied in taking two agricultural periodicals, costing him a dollar and a half yearly besides postage, and which, in connection with his own

experience and good judgment, have been the chief guides in most of his great improvements. He has been enabled to add sixty more acres to his land, and the whole presents a beautiful specimen of neat, finished and profitable farming.

None of this is fiction. It was gradually accomplished by years of constant, steady, intelligent perseverance.

A great loss occurs to the majority of farmers from too meagre an expenditure for implements—the effective medium for the action of all the labor. The eagerness to secure big farms, at the cost of their profitable culture, is a most fruitful source of bad husbandry. We observe by the last census, that the cash value of farms in the Union is over three thousand million dollars, and the value of farm implements only a hundred and fifty millions; that is, each farm worth three thousand dollars, has, on an average, only a hundred and fifty dollars worth of plows, cultivators, rollers, carts, wagons, harrows, fanning mills, straw-cutters, root slicers, harness, shovels, spades, forks, hoes, horse and hand rakes, scythes, cradles, axes, hammers, sleds, wood saws, hay knives, ox yokes, chains, &c., &c., to say nothing of reapers, grain-drills and threshing machines, which may possibly be borrowed or hired. Instead of only $150, all these cannot be had of good construction and quality, for much less than $500, leaving a deficiency of about $350 to be made up by slip-shod cultivation and by borrowing. In England, where taxes, poor-rates, rents, and tithes, constitute together an enormous drawback on the profits of farming, and where consequently, every operation must be performed to the best possible advantage, no one need hope for success who does not possess an amount of capital equal to forty dollars per acre, for procuring implements, animals, seeds, manure and labor. "No prudent man," says the Mark-Lane Express, "*ought* to rent more than he has that amount at least, of available capital to go on with."

If, therefore, our farmers generally laid down at the commencement of their labors, the great fundamental principle that capital as well as farms is indispensable to succcss—that they might as well undertake to run a car on a single rail, as to farm with land only, or capital only—that they must especially lay in a heavy amount of that most efficient of all kinds of capital, *thorough knowledge*—they need no longer complain that they have a machine they cannot profitably manage—a locomotive without fuel. or without a competent engineer to take charge of its levers.

PLANS LAID IN WINTER.

There are many of the smaller, but almost indispensable conveniences of a farm, that are scarcely ever all present in one establishment; many, indeed, being destitute of most of them, and the best farms being perhaps deficient in a few. The farmer has leisure in winter to look over these deficiencies, and may often either supply them at this season, or make partial provision for them, or lay his plans for securing them in summer.

For example—Every farm should have gates for entering the fields

instead of bars. Some farmers are sufficiently ingenious to make these with their own hands, in winter.

Every farm should have a good road or lane from the barn-yard to every field, so that loads of manure or grain may not require drawing across a meadow or corn-field, nor cattle need driving to pasture through a wheat-field.

The fences should be so good that cattle may never be tempted nor learned to jump; that crops may not be trodden down by intruders, nor valuable animals foundered; and that the urgent time of the farmer in harvest may not be consumed in driving out depredators and in patching up the imperfect boundary. Difficulties between neighbors from intrusive animals will perhaps be recollected by some,—where a good fence has proved a *defence*—a bad one an *offense*.

A capacious wood-house, for the thorough seasoning of at least one year's fuel, is indispensable. Two, for one year each, are better, one to be filling while the other is emptying. Or if only one is built, a door should be placed at each end, so that the dry may be taken out at one door, while the green is carried in at the other.

Capacious rain-water cisterns should be provided for all the principal buildings, so that there may be room for at least five hogsheads of water for every ten feet square (100 sq. feet) of roof, in order that no rain-water may be lost, and which is at least five times as capacious as cisterns are commonly made. Such would save much trouble in times of severe drouth.

Every farm, besides a barn and dwelling, should be furnished with a tool-house, wagon-house, work-shop, corn-house, granary, smoke-house, manure-shed, cattle-sheds, poultry-house, a good, neatly-made and neatly-kept piggery, a neat vegetable cellar, a fruit cellar, a straw-barn, a business office, a clothes-drying alley, a large root cellar, and lastly, but by no means the least in importance, neat, well-painted, (both internally and externally,) and nicely kept *privies*, so arranged as to be kept inodorous by frequent applications of ashes, lime-dust, dried peat, saw-dust or charcoal, kept in a flat, water-tight, gas-tarred box, placed on runners, so as to be drawn off frequently by a horse, and emptied.

Besides the foregoing, the good kitchen-garden must not be forgotten, to be well supplied with the smaller fruits, currants, strawberries, raspberries, gooseberries and dwarf pears, as well as with the finest early, medium, late and winter vegetables; nor the neat door-yard lawn, judidiciously and tastefully planted with ornamental trees and shrubs, and occupying not merely the front of the dwelling, but extending on each side, so that the occupant may not be frightened if the casual visitor chances to cast a glance on any other side of the house than the front. The well planted and well cultivated orchard, for supplying fresh fruit the year round, to the table and kitchen, as well as for market, will suggest itself to every intelligent farmer at the present remarkable fruit-planting and fruit-eating era.

THE COUNTRY GENTLEMAN, published at Albany, is one of the best agricultural papers in the State. It is got up in convenient form for binding, and is edited with care and ability. No farmer could fail of being pleased with it.—*Olean Journal.*

LIGHTNING RODS.

This subject is often unnecessarily involved in a great deal of mystery, and as a consequence many useless directions are given. We shall therefore very briefly point out what is requisite in a good conductor. that our readers may know precisely what is wanted.

1. *Sharp points at the top, to draw off the electric fluid silently* When a rounded knob is made to approach a highly electrified body,—as every one familiar with the use of the electric machine knows,—the fluid passes to the knob in the form of an explosion, as soon as the knob approaches within a certain distance. This distance is longer as the charge is greater. But if a sharp point is made to approach the charged body, the fluid is drawn off silently in a stream, with no explosion whatever, and at a greater distance than its passage could be effected between balls or blunt surfaces. Hence the very great importance of sharp points at the upper end of the rod—drawing off the lightning from a highly charged cloud, safely and silently, while the cloud is yet at such a distance from the building as to preclude the danger of striking. Where, however, the cloud is unusually loaded with electricity, and approaches very rapidly, the point may be insufficient to drain the whole, and an explosion, producing heavy thunder may take place. This may be prevented, at least in a great degree, by several points at the upper extremity of the rod, all of which may operate together. The same effect will be produced whether these points are within an inch of each other or a foot asunder. Some years ago, we examined a rod having but a single point, just after a terrific clap of thunder which followed simultaneously the flash, and we found that the point, which was tipped with thin silver, had been melted, iron and all, into a ball the size of a lead bullet. Portions of the building were very slightly splintered; and without the rod it would have been doubtless torn to pieces. Had there been several points it is probable none would have been melted; and possibly the explosion might have been less severe. As it was, the largest cannon would have been a mere pop-gun to it.

It is not necessary that the point be tipped with silver, gold or platinum; if filed as sharp and bright as a needle, it will remain so many years, and never become dull enough to cause damage.

It is said that soon after the Revolutionary war broke out between England and America, and after Dr. Franklin had made his electric discoveries, certain officials of the British government, unwilling to acknowledge their indebtedness to the Yankee, substituted knobs for points, which brought out the following epigram:

While you, great George, to show affront,
Your sharp conductors change to blunt,
The nations's out of joint;
Franklin a wiser course pursues,
And all your thunder fearless views,
By *keeping to the point.*

2. *A sufficient height above the roof of the building.* It is said that lightning has never been known to strike within a distance from the rod, twice as great as the height of the rod above the building. Or in other words, a rod will protect a circular space whose diameter is four times

as great as the height of the point. A barn forty feet long would therefore be safe with a rod *at the middle* ten feet above it; or with a rod at *one end* twenty feet above; or with a rod at *each end*, ten feet above. A barn 90 feet long, like that of our Tennessee correspondent, would require a rod at the center, or at each end, 22 feet high above the roof. Or, a rod might be placed 22 1-2 feet from each end, only eleven feet high, and be equally efficacious. These two rods might be connected by a horizontal one to a larger one at the center running down into the earth.

3. *A continuous connection throughout.* The best rods are welded together in one piece. But where this is inconvenient, the two parts may be screwed together with each end into one common nut; or they may be placed side by side and rivited, or screwed together. The connection is as complete, so far as thunder and lightning are concerned, by two surfaces in actual contact merely, as if welded together; the only precaution in this case being to secure the connection from any accident which might after a lapse of years produce a separation, and which would immediately make the rod worse than no rod at all, by attracting the fluid, without a provision for its escape to the earth.

4. *Entering the earth several feet at the bottom.* However perfect every part of the rod may be, it will do more harm than good, unless the fluid can pass off with perfect facility and become dissipated in the earth. Moist earth is always a pretty good conductor; dry earth is a poor conductor. It is therefore highly requisite that the rod descend deep enough to enter the permanently moist stratum, or the portion that remains moist independently of the drouth of summer. This will of course vary in different places; but as a general rule, a hole at least six feet deep should be dug for this purpose. It will greatly assist the dissipation of the fluid by placing in the bottom of the hole, in contact with the rod, at least half a bushel of common charcoal, which is an excellent conductor.

Some rods, perfect in other respects, become worse than useless by not sinking deep enough. Some years ago a meeting-house was struck with lightning, although furnished with what appeared to be an excellent conductor. The building was injured, and the earth torn up around it. On examination, the lower end was found to enter the earth but a short distance, and the season being very dry, and the soil destitute of moisture, no escape was afforded for the electric fluid.

5. *The size of the rod* should be sufficient to carry off any discharge without becoming heated, as would be the case if too small. Three-fourths of an inch would doubtless be enough in any case whatever. The portion above the building must however be stiffer, to withstand stormy winds, especially if it rise many feet above the roof. We found the best way by welding together three or four pieces of different sizes, placing the larger below. This gives the rod a gradual taper to the top. The larger portion should extend down far enough to admit of thorough stiffening.

6. *The proper mode of fastening to the building*, is very imperfectly understood. The electric fluid always takes the best conductor, and will not pass into wood or other imperfect conductor, so long as it can find a ready escape through metal. The discharge from a machine severe enough to knock a man senseless, may pass unfelt through a metalic rod

held in the hand, provided the escape through the rod is perfect and unimpeded. So, there is no danger of the fluid passing into the building through wooden supports, so long as there is a ready communication to the moist earth below. Nothing can be more absurd than the common practice of passing the conductor through glass rings supported by large iron staples. For, in the first place, a *very small* discharge would leap over the glass from the rod to the staple; secondly, the glass when wet with rain, is no insulator at all—is perfectly useless; thirdly, the staple, with its sharp points driven into the building, serves to direct the current from the rod to the building, whenever there may be an excessive discharge. No support is better than seasoned and painted wood—an incomparably poorer conductor than iron, and not presenting the slightest chance for any considerable portion of the electricity to enter the walls. An auger-hole is bored for the passage of the rod. As a matter of precaution in extreme cases, it is best to have the wooden supports project about half a foot from the walls, so as to hold the rod off at that distance. In the instance we have already related, of a rod being so heavily charged as to melt the point into a ball, not the slightest effect was visible on the wooden supports which held the rod in direct contact.

By observing the preceding directions, any farmer may employ a common blacksmith, and erect his own rod properly, without paying double price to itinerant rod-erectors, who often do not understand their business properly. Procure three-quarter inch rods; weld them or screw them together; let the part above the building be stiffer, and tapering; weld together a few smaller sharp pieces for points at the upper end, and file and polish them sharp; dig a hole six feet deep at the bottom; throw in a bushel of charcoal before filling it; secure the rod to its place by passing it through holes in wooden supports, and nail them firmly to the building, and the thing is done.

DEPTH FOR BURYING MANURE.

Men are divided as to the proper depth of burying manure. Some hold that it sinks in the soil, is washed downward by the leaching rains, and should therefore be applied near or at the surface. Others assert that its volatile and most valuable parts rise by fermentation, and that consequently it should be buried deep. Now it usually happens when doctors disagree that both are partly right and partly wrong; but in the present instance, they are both a little in the right, and a great deal in the wrong.

Manure usually stays very nearly where it is put. If buried near the surface, it remains near the surface; if buried deep, *there* it remains; if plowed under in large lumps, it has but little power to rise, sink, or in any other way to intermix itself, and hence the reason that through pulverization or harrowing before manure is turned under, gives a result in large crops.

The power which clay has to absorb the fertilizing portions of manure, is very great. Soils which possess a medium amount of clay or loam,

with a medium degree of tenacity, will absorb all that is valuable in ordinary yard manure, equal to nearly their own bulk. Forty loads of manure to the acre, form a heavy coating; yet this is only one load to four square rods, constituting a depth, when spread, of only one-third of an inch. Consequently, when a coating of forty loads to the acre is plowed under, the volatile parts have only to pass one-third of an inch or so, before they are all absorbed by the soil. Hence the error of supposing that they can possibly, in ordinary soils, rise or sink to any practicable depth. And hence also, the great importance of mixing manures very intimately through all parts of the soil, if plants are to get their full benefit, and not to be over-fed at one part of their roots and starved at another.

There are many proofs of the correctness of the position here taken. We have made large piles of compost, consisting of one-third rich stable manure, and two-thirds of loam and turf, yet all the odor was completely retained, and not the slightest portion passing off could be perceived by the smell. We have buried large dead animals with a coating of only six inches of loam; not the faintest indication of the decomposition below ever reached the surface. On the other hand, the soil which forms the bottom of manure yards, is not found even within a few inches of the surface to be at all enriched by the piles of fertility which rest upon it.

The true rule for burying manure, is to place it just at such depth in the soil as the roots of the crop usually extend, which will vary with different plants. Some of the grasses, for instance, form a turf very near the surface, and hence an autumn top-dressing will soak in enough to benefit them essentially. Clover roots run deeper, and this crop is consequently but little benefitted by top-dressings when of much size, except so far as they operate in keeping the surface moist. The roots of fruit trees are still deeper, and they derive but little advantage except from manures well spaded or worked in. They however possess an important advantage over annuals and perennial rooted plants; by continuing in growth for successive years, those roots which happen to run into the region of fertility, soon throw out numerous fibres, and secure an amount of nourishment, of which annual plants, in consequence of their more limited powers of extension, are not able to avail themselves.

There are, however, not many crops which do not need the full depth afforded by ordinary plowing; and hence the best practice for nearly all kinds of culture, is to spread the manure well, harrow it most thoroughly, in order to break it as finely as possible, and at the same time to mix it intimately with the surface; then turn it under by ordinary plowing, and the lower half of the inverted earth will furnish a thoroughly enriched bed for the roots to penetrate. If a greater depth of fertility is needed than ordinary plowing affords, the coat of harrowed manure may be thrown under ten or twelve inches by means of a double mouldboard or Michigan plow; and then another coat of manure spread, harrowed and plowed under by a light or gang-plow. The young plants of the crop are thrown rapidly forward by the upper stratum of manure, and at a later stage of growth, are equally stimulated by the lower stratum.

Milking Clean.—Experiment has shown that the milk last drawn from the cow, is from ten to twelve times richer than the first drawn portions, or contains from ten to twelve times as much cream.

AGRICULTURAL NOTES.

BREAK THE CRUST.—Every observant farmer must have noticed the crust which forms on the surface of newly stirred soils, after lying a few days to the action of the dews. A much heavier crust is formed by each shower of rain which falls. Good and successful cultivation requires that this newly formed crust be often and repeatedly broken by the hoe, harrow, or other instrument.

A striking instance in proof of the importance of this practice, has just been stated by an extensive farmer. He planted a field of broom corn, and by way of banter, told the man who assisted him, that each should choose a row as nearly alike as possible, and each should hoe his row, and the measured amount of crop on each should be the proof which was hoed best. Our informant stated the result in substance as follows:—"Determined not to be beaten, I hoed my row, well, once a week the summer through. I had not seen my assistant hoe his at all; but had observed that for a long time he was up in the morning before me. At length I found him before sunrise, hoeing his broom-corn, and I asked him how often he hoed it; he answered, "Once a day, regularly." The result of the experiment was, his row beat mine by nearly double the amount."

ROOT CROPS.—William Garbutt, of Wheatland, N. Y., who raises from three to five acres of roots per annum, besides potatoes, is convinced from long experience, that cooked potatoes are the cheapest food for feeding swine; that ruta-bagas and field beets are most valuable for neat stock, and especially to grain growers who have an abundance of straw; that carrots are most profitable as extra feed for horses in winter; and that the large sugar beet and mangel wurtzel are the most valuable succulent food for milch cows in winter.

CORN FOR FODDER.—Let no farmer neglect at the proper season to sow a plentiful supply. Several years' experience enables the writer to say, that at least double the amount of the best fodder may thus be obtained from an acre, over any other known mode, and very often triple the amount. If most meadows which now produce scarcely a ton per acre, were plowed and planted in this way, they would scarcely fail to yield four tons of the best and finest cattle feed, and many would yield five or six tons.

The management of the the crop, however, must be of the proper kind, or complete success cannot result. Never sow broadcast,—for this requires four or five bushels of seed per acre, to succeed well, is less productive, and does not leave the ground clean. Invariably sow in drills as follows:—Furrow the land, (after it is plowed and harrowed,) three feet apart, with a single horse plow; scatter the seed thickly along these furrows from a hand-basket, so that there may be at least forty or fifty grains to the foot. Cover the seed by a two-horse harrow, run lengthwise or crosswise with the furrows, and the crop is in. The only after-culture consists in running the cultivator once or twice between the rows—all weeds will be shaded and destroyed by the crop—and the ground will be left early in autumn when the fodder is cut, as clean as a traveled road.

The seed may be sown any time during the early part of June —two bushels will be required per acre—and it may be harvested

early in autumn, in time for a crop of wheat. The stalks should be stacked as dry as possible—in small stacks—and well salted—or injury by heating and mouldiness will follow.

Fine Farming and Great Crops.—James Gowen, of Mt. Airy, near Philadelphia, raised, in 1845, a ten acre field of corn, which averaged 95 bushels of shelled corn per acre. It had been in grass, without manure, five years; it was plowed, and the field manured with a ton of guano, costing $40. The rows were 3 1–2 feet apart, and the plants 12 inches. (This distance would be too great for small northern corn.) Judicious harrowing, in preparation, cleared the ground thoroughly of grass and weeds, and it was kept perfectly clean afterwards at little cost. There were 7 acres of winter wheat, and one of spring wheat, the whole computed to average over forty bushels per acre. The spring wheat was after an acre of carrots, of 900 bushels, and was followed by an acre of turneps of 1000 bushels; the whole worth over $500,—from one acre in two years. The carrot crop the same year was 1000 bushels per acre, sugar parsnep, 800 bushels, ruta baga, over 600, potatoes, 8 acres, over 200 each. These were only part of the crops. Besides, there were more than 100 tons of excellent hay, though the season was unfavorable. All on an upland farm of about 100 acres, which maintained during the summer over 60 head of cattle. So much for manure, subsoiling, fine culture, draining, rotation, &c.

Successful Subsoiling.—Henry Colman says, that Smith of Deanston, when he commenced operations, about 20 years ago, had on a part of his farm not more than four or four and a half inches of surface soil; but having applied the system of thorough draining, and used the subsoil plow, he can now turn up more than sixteen inches of good soil. Subsoiling had failed in some parts of England, where very heavy clay and quicksand prevailed. In one case there was a crop of 35 bushels of wheat per acre, where the subsoil furrows were across the drains; and only 27 1–2 bushels where they were parallel with the drains.

Waste of Manure in Cities.—The London sewers pour daily into the Thames, 115,000 tons of mixed drainage. One part in 80 is regarded as rich, fertilizing, solid manure, or 3,800 tons daily. This amount would richly manure every year more than 50,000 acres of land.

Destroying Pea Bugs.—A correspondent of the American Farmer tried a very simple and satisfactory experiment to prevent bugs in peas. Having discovered the egg in each pea while yet in the pod, he gathered them as soon as they were ripe and thoroughly dry, and closed them air tight in bottles. The insect could not grow without air, and next spring not a bug was to be seen.

Sowing Clover Seed.—Those who have not yet sown nor procured their clover seed, should remember the result of experiments, published in the Cultivator some years ago which proved, *that clover seed kept over one summer would be dear at half price*. This seed greatly deteriorates by age; hence care should be taken to have it as fresh as possible. Experiments performed in England have shown that clover seed does best when but very slightly covered, or very near or at the surface of the earth. Thirteen compartments or beds were sown, the seed in each successive one being buried a quarter of an inch deeper than the preceding; and varying from merely sprinkling on the surface, to three inches deep. The following numbers indicate the number of plants which came

up in each bed from an equal number of seed, each successive one being a quarter of an inch deeper;—17, 16, 14, 11, 11, 8, 4, 4, 0, 0, 0, 0, 0. From no depth to about one inch, the seed mostly came up; but two inches deep and deeper, none came up. Hence the impolicy of covering clover seed with a heavy harrow; washing in by rain on fresh earth, or working in by the crumbling influence of frost, being better.

Old and New Clover Seed.—A correspondent of the American Farmer, says that clover seed at the second year has not lost its vegitating power, though from the increased hardness of the shell, it sprouts more slowly, a difficulty removed by soaking the seed 24 hours before sowing, in salt water, at 120 degrees Fah. and then rolling it in powdered lime or gypsum.

Harrowing Wheat in Spring.—Myron Adams, of East Bloomfield, N. Y., has for many years harrowed over the whole of his wheat fields every spring, pulverizing the crust and greatly benefitting the crop. If the ground is to be seeded with clover, it is harrowed in at this time. The whole amount torn up by the roots has been found by examination not to exceed the amount of a bushel on ten acres. The wheat looks rather unpromising when thus dusted over with earth; but the first shower washes it off, and leaves it clean, fresh and vigorous.

HINTS FOR FRUIT-GROWERS.

Cultivating Fruit Trees.—So great is the loss resulting from stunted and diseased growth, occasioned by neglected cultivation, that an intelligent cultivator gave it as his opinion, that "if nine-tenths of our orchards should be cut down, and the labor and cultivation which they receive be expended on the remaining tenth, *more* and *better* fruit would be raised."

Soap Suds for the Grape.—A. J. Downing says "I have seen an Isabella grape produce 3,000 fine clusters of well ripened fruit in a single season, by the liberal use of manure and soap-suds from the weekly wash."

The effect of soap-suds on other plants is sometimes surprising. A cypress vine, which had remained stationary for a fortnight when about two inches high, immediately commenced growing after a good watering with soap-suds, and grew about 6 inches the first five days. The peach is much benefitted by soap-suds.

Pruning.—It is said that the donkey first taught the art of pruning the vine; man being merely an imitator, on seeing the effect of cropping the points of the young shoots. It is not always the greatest wisdom to originate, but to turn to good account whatever by thoughtful observation comes within our reach.

Hard to suit all.—At the American Congress of Fruit Growers, in 1848, a fruit committee of nine persons prepared a select list of fruits worthy of general cultivation. Although many hundred sorts of the pear have borne fruit in this country, all perhaps prounouned "*excellent*" by the nurserymen who sold them, yet there were only *two* that the fruit committee could *unanimously* agree upon to recommend, namely, the Seckel and Bartlett.

LUCK WITH TREES.—We have noticed that certain men always have much finer peaches, and pears, and plums, than most of their neighbors, and are called *lucky*. Their luck consisted, in the first place, in doing everything well—taking what their neighbors called foolish pains—leaving nothing unfinished; and in the second place, in taking good care of what they had; that is, giving their trees wide, deep, and mellow cultivation, applying manure where necessary, and especially the liquid manure from the chamber and wash tub. Great pains taken, whether with fruit trees or with children, scarcely ever fail to produce good results.

MULCHING FRUIT TREES. —A correspondent of the Horticulturist planted 150 trees in an orchard in very good but rather dry soil. All were planted with equal care, but a third of them were *mulched*, or the surface of the ground when planted covered with 6 inches of litter. Those thus treated all lived; but 15 of those not mulched died in the hot dry weather of midsummer. It is not stated that the soil was kept clean and mellow around them; which will often save the life of trees, when they would die of neglect.

LIQUID MANURE—GRAPES.—The *Ohio Cultivator* says that a grape vine at a hotel in that state, but three years old, has climbed to the second story, and has extended its branches round the corners of the building to a distance of twenty or thirty feet, nearly the whole being full of clusters of fruit. The only unusual treatment it had received, was a watering every day with dish-water, and occasionally with soap-suds.

SEASONABLE HINTS.—During mild weather in winter, hardy fruit trees may be pruned as well as grapes, and grafts may be cut. Young fruit trees, which have not had a conical bank of earth thrown around them,—the most perfect protection from mice—should have the snow trodden around them as often as it freshly falls, which will exclude the mice from them. Catterpillar eggs—known at a glance by their knobby clusters on the smaller branches—should be torn or cut from fruit trees before they hatch in spring.

PROFITABLE ORCHARD.—The *American Agriculturist* says, "A gentleman within our knowledge has a small orchard on the Hudson river, of less than seven acres, which produces from $500 to $750 worth of apples annually. This is not one year of plenty, and another or two of famine, but is a regular, steady, average yield. All this is secured by the simplest process, viz., good management."

MANURE FOR FRUIT TREES.—"What is the best manure for fruit trees, to spade or work in near the roots, of general application?" G. C.

The following has been found after several years experience, to constitute one of the best manures for fruit trees generally. A mixture of peat or swamp muck, with one-half to one-quarter of its bulk of stable manure, and about one-twentieth of leached ashes. These ingredients should lie in a heap together for a few weeks, and then be worked over. If for peach trees, the soap-suds from the laundry thrown over the heap will improve it. If for cherry trees, which will not bear high manuring, the proportion of peat or muck should be larger, and with less of yard manure and ashes.

PROFITS OF FRUIT CULTURE.—S. B. Parsons, in his recent address before the New Haven Horticultural Society, states that within a few

miles of his residence there is an orchard of about twenty acres, producing $2000 a year, the vegetables between the trees paying the cost of cultivation—that the vineyards of Dr. Underhill, on Croton Point, are said to yield a nett profit of some $4000 per annum—that two cherry trees of his own yielded often $80—and that the nett profits of the great Newtown Pippin orchard of R. L Pell. at Esopus, are some $8000 per annum.

CARE OF DOMESTIC ANIMALS.

STEAMING CHOPPED FOOD.—An English farmer who keeps 90 head of cattle and horses, estimates that he saved thirty tons of hay in one year by chopping and steaming a mixture of equal parts of hay and straw, and saving $270 worth of hay. The cost of the cutting and steaming was less than $20.

FEEDING CATTLE.—Cattle standing in cold muddy yards, exposed to the weather, consume about twice as much as those in sheltered stables, kept clean and littered, and free from the accumulations of manure.

CLOSE AND LIBERAL FEEDING.—A. Todd, of Smithfield, R. I., states in the *N. E. Farmer*, that he had five cows pastured on a piece of land, but not feeling satisfied with the amount of feed they obtained, he sold one at the end of the year. He consequently found that the four yielded a greater *nett profit* than the five had done. "Concluding in my mind," says he, "that if four cows were more profitable than five, on the same principle *three* might be still better, (although I find no rule in "Adams" or "Smith" that supports this doctrine,) I accordingly disposed of another, and by taking a little extra pains with the *three* left, I churned *more butter* from the three than I had in any preceding year from the four or five."

REMEDY FOR WINTER-KILL.—A correspondent of the Ohio Cultivator, gives the following preventive of *winter-killing* in cattle, hogs and sheep, many often dying during winter and early spring:

R.—Good shelter-um, q. s. (*quantum sufficit.*)
Corn-meal-um, q. s
Clear water-um q. s

The "*corn-meal-um*" to be made into a poultice, and to be kept constantly applied to the mucous membrane of the stomach. [For the benefit of strictly professional men, the above may be given as follows:

R.—Refug. opt. q. s.
Zea pulv. q. s.
Aq. font. q. s.]

TIME FOR HEIFERS' CALVING.—A late English writer considers it a matter of great importance, that heifers should be so managed as to have their first calf late in spring, when there is an abundance of succulent food, inducing a large supply of milk. This is much better than to have them come in early in spring, when they have dry food only. The habit at first formed is apt to remain with them, and if they commence by giving a good supply of milk, they are apt to be good milkers afterwards.

BEAN MEAL FOR MILCH COWS.—We have on former occasions alluded to some trials that have been made in feeding milch cows with bean meal,

the results of which seemed to show that it was a highly valuable article. At a late meeting of an English Farmers' Club, it was stated by a member, that nothing was so good for cows in milk, either as regarded the produce of butter or cheese, as bean meal.

FEEDING CATTLE IN WINTER.—The *American Farmer* says, "A neighbor of ours had an oblong tight box made, with a top—he filled this box with cut stalks, poured over them a pot of boiling water, shut down the lid and put a weight upon it, and thus cooked them with the steam. By the time the water became milk-warm, the stalks were sufficiently cooked. For his milch cows, he had bran or mill feed mixed; and they were always in a thriving condition."

HENS IN WINTER.—S. W. Cole says that hens will never lay well in winter, unless they are made to "scratch for a living." This is done by burying their grain several inches in gravel. He states that eight hens, which did not lay an egg in a month in winter, by adopting this course, laid three times as many eggs the following winter, as their whole feed cost.

HINTS ON GARDEN MATTERS.

GIANT ASPARAGUS.—A correspondent of Downing's Horticulturist, raises shoots of asparagus, which, he says, are without exaggeration, as large as his hoe handle, and perfectly tender and succulent, by this method:—One part of hen dung to forty parts of stable manure, are spread two inches thick on the bed, in autumn, and forked in. The next spring this is turned over slightly, and a coating of a quarter of an inch of salt added. This dissolves by rains, and kills every weed, while it promotes a vigorous growth of asparagus. He cuts his asparagus when about six inches high, *wholly above ground*, and then it is all perfectly tender.

EARLY LETTUCE.—Take up the plants, which have been sown in the open ground in autumn, and set them in a hot bed as soon as it is made, and they will be fit for the table two weeks earlier than those from seed sown in the bed.

STIR THE SOIL.—The greatest horticulturist, almost, of the present day, says, "If I had '*a call*' to preach a sermon on gardening, I should take this for my text: STIR THE SOIL."

SALT FOR ASPARAGUS.—The editor of the New England Farmer says that asparagus will bear one hundred and sixty bushels of salt per acre, and be greatly benefitted by the application—and that cabbages and turneps are much benefitted by salt.

POSITION OF FLOWER-BEDS.—It often happens that two different flower beds may be equally well managed and flourish alike, yet one may be a mass of brilliancy while the other exhibits litttle or no beauty. There are many flowers which always face the light of the sun; consequently the beds should be so placed that the spectator in the walk or window, should look them *full in the face*. That is, the strongest light and the position of the spectator should always be on the same side of the bed. This will be found particularly necessary with the pansy or tri-colored violet, and some other of the smaller flowering plants.

HYACINTHS IN WINTER.—Hovey's Magazine describes the mode of pro-

ducing a very pretty effect by growing hyacinths in baskets of moss. An open worked French basket may be procured, the inside lined with moss and a glass or other dish filled with moss, to hold the bulbs placed inside. The moss in the dish is to be kept well moistened, but the bulbs must not be overflowed with water, or decay will follow.

Rose Cuttings.—One of the best methods of securing the success of these, is to stick the cutting about an inch deep into *clean* river sand—with properly prepared soil about an inch below to receive the roots as soon as they strike. The clean sand prevents the roots from rotting. A correspondent of the *Horticulturist* succeeded with this when every other mode failed—and says he does not lose one in twenty.

DOMESTIC ECONOMY.

Mode of Making Yeast.—The following mode, which is found very covenient in practice, was stated to us by a notable housewife. One quart of hops is boiled about three hours with about seven gallons of water; after that the resulting liquid is passed through a cullender on three quarts of Indian meal, or so much that the mixture will be like *batter*. Half a tea-cup of salt is added, and when cooled to new milk warmth, half a pint of yeast. After stirring well, it stands 15 or 20 hours, and Indian meal added till of the consistency of dough, when cakes, three inches in diameter and half an inch thick, are made from it, and dried on a board by the fire; much heat will destroy the yeast, and if not dried in two or three days, fermentation will proceed so far as to destroy it. These cakes will be good for three months; one of them soaked half an hour in warm, not hot water, will be enough for a large loaf.

The yeast prepared by the Hungarians is similar, and will keep, it is said, a whole year. During the summer season, they boil a quantity of wheat bran and hops in water; the decoction is not long in fermenting, and when this has taken place, they throw in a sufficient portion of bran to form the whole into a thick paste, which they work into balls and dry by a slow heat.

Preserving Cabbages.—There are several good ways of keeping cabbages during winter by burying them out of doors. The difficulty is, it is hard to get at them during winter, without damage to those left. The following plan appears to avoid this difficulty:—Cut the head from the stump, and pack closely in a cask, taking care to fill up all the vacancies with chaff or bran, and keep in a dry cellar.

To Remove Dust from the Eye.—Immerse the affected eye in a vessel of clear cold water, and then rapidly open and shut it a few times, when the dust will be washed away.

Curing Beef.—By most of the modes now in use, the beef becomes too much impregnated with salt, and is not as a consequence so fine for eating. By the following process this difficulty is prevented, and the beef will keep till the following summer: To 8 gallons of water add 2 lbs. of brown sugar, 1 quart of molasses, 4 oz. of nitre, and fine salt till it will float an egg. This is enough for 2 common quarters of beef. It has

been repeatedly tried and found very fine; a famous beef eater says it is the only good way.

To Remove Spots from Leather Gloves.—Suspend them in a glass jar, closed, over a portion of the strongest liquid ammonia. The gaseous ammonia gradually removes the spots; but great care is to be taken that the liquid does not touch the gloves, or the color will be badly injured.

To Extinguish Chimneys on Fire.—"First shut the doors and windows of the room containing the fire; stop up the flue of the chimney with a piece of wet carpet or blanket; and then throw a little water or common salt on the fire. By this means the draught of the chimney will be checked, and the burning soot will soon be extinguished for want air. Let this be remembered by the reader."

Water-proof Glue.—Render glue perfectly soft, but not liquid, in cold water; then dissolve it by gentle heat, in linseed oil. It dries almost immediately, and water will not affect it.

Keeping Beef Fresh.—Combe says the *ribs* will keep longest, or five or six days in summer, the middle of the *loin* next, the *rump* next, the *round* next, and the brisket the worst, which will not keep longer than three days in summer.

Indelible Ink.—This may be made much cheaper than purchased, as follows: Two drachms of nitrate of silver, added to four drachms of a weak solution of tincture of galls. Another: Nitrate of silver one drachm, mixed with a solution of half an ounce of gum arabic in half a pint of pure rain water. Moisten the cloth previously with a strong solution of pearl, or salt of tartar, and iron it dry.

Wheel Grease.—Two parts hog's lard by bulk, and one each of black-lead and wheat flour. We have heard wagons a mile off on a still morning, uttering the most dismal sounds, from the want of a little of this material, and which a very little imaginatiou translated into words —"meeze-e-ry, meeze-e-ry, meeze-e-ry!"

BENEFITS OF AGRICULTURAL READING.

"Book Farming."—Samuel Williams, of Waterloo, says, "I know a farmer who has paid over $800 for a private library, and who takes both the *Albany Cultivator* and *Genesee Farmer*. In proof that he is something more than a theoretical farmer, he sold the surplus products of his farm last year for over $1400, and he paid out of the same but $90 for hired help—he has no children old enough to work in the field. It is hardly necessary to say that he is fully up to the improvements of the age."

Agricultural Reading.—Milton J. Ross, of Allen Co., O., says, in the Ohio Cultivator, "This year I had twenty bushels of wheat to the acre, from a field of forty acres—which for this region is a remarkable crop—and I attribute the extra yield *entirely to knowledge I have obtained by reading*. When I commenced farming, twelve years ago, my wheat crop was only six to eight bushels per acre." * * "Mr. Buel, in his life time, furnished me information, through his "Cultivator," in re-

lation to making and using manures, that is worth to me, at least *five hundred dollars*. Mr. Buel also learned me how to raise one hundred bushels of potatoes from two bushels planting."

☞ J. P. MITCHELL, of Frankfort, Kentucky, in a letter to the Cultivator, says: "My neighbors frequently come to me and inquire, 'Why is it that your crops are twice or thrice as large as mine?' and 'Why is it that your land is getting richer and mine poorer?' My universal reply is—'I read the Cultivator.'"

A PROFITABLE SPEECH.—A correspondent of the *Farmer's Cabinet*, says that after hearing an excellent speech from Dr. DARLINGTON, before the Philadelphia Agricultural society, on the proper use and care of implements, he was induced to make such useful repairs, provide a tool-house, and keep his implements in so much better order than before, that "he calculates his saving in wear and tear of tools, since the delivery of that speech, has not been less than $50 per annum; while the time gained by having everything in its place, was worth as much more" —adding $100 a year to his income.

LOSS OF HEAT.—By experiments made some years ago in Philadelphia, the following proportions of heat were radiated or thrown out into the room:

Sheet iron stove with	42	ft.	pipe,	radiated	100	parts	of heat.
do do	13	"	"		95	"	"
do do	5	"	"		67	"	"
Cast 10 plate stove,	5	"	"		45	"	"
Open Franklin stove,	5	"	"		37	"	"
Open coal grate,			"		18	"	"
Common fire place,		"	"		10	"	"

LUNAR INFLUENCE.—Duhamel cut a great many trees in all ages of the moon, but under other circumstances precisely similar; but in all his experiments, discovered no difference in the timber. Chauvalon, at Martinique, tried accurate experiments on many kinds of vegetables in the same way, planted at different times in the lunar month, but discovered no appreciable difference.

A ROARING FOUNTAIN.—The highest fountain in the world, is on the grounds of the Duke of Devonshire, in England, where a single jet is thrown up to a height of 267 feet—more than 100 feet higher than Niagara Falls. The eight acre reservoir which supplies it, is 889 feet above.

ENJOYMENT OF LIFE.—Two wealthy citizens of Boston, now considerably advanced in life, were lately conversing in regard to the period when they had best enjoyed themselves. "I will tell you," says one, "when I most enjoyed life: soon after I was twenty-one, I worked for Mr. ———, laying stone wall, *at twenty-five cents per day*." "Well'," replied the other, "that does not differ much from my experience; when I was twenty, I 'hired out' at seven dollars per month; I have never enjoyed myself better since." The experience of these two individuals teaches—1st, that one's happiness does not depend on the amount of his gains or the station he occupies; 2d, that very small beginnings with industry and prudence may secure wealth.

TEN REASONS FOR UNDERDRAINING.

1. It prevents water which falls from resting on or near the surface, and renders the soil dry enough to be worked or plowed at all times.
2. By rendering the soil porous or spongy, it takes in water without flooding in time of rain, and gives it off again gradually in time of drouth.
3. By preventing adhesion and assisting pulverization, it allows the roots to pass freely through all parts of the soil.
4. By facilitating the mixture of manure through the pulverized portions, it greatly increases its value and effect.
5. It allows water falling on the surface to pass downward, carrying with it any fertilizing substances, (as carbonic acid and ammonia,) until they are arrested by the absorption of the soil.
6. It abstracts in a similar manner the heat contained in falling rains, thus warming the soil, the water discharged by drain-mouths being many degrees colder than ordinary rains.
7. The increased porosity of the soil renders it a more perfect non-conductor of heat, and the roots of plants are less injured by freezing in winter.
8. The same cause admits the entrance of air, facilitating the decomposition of enriching portions of the soil.
9. By admitting early plowing, crops may be sown early, and an increased amount reaped in consequence.
10. It economizes labor, by allowing the work to go on at all times, without interruption from surplus water in spring, or from a hard baked soil in summer.

RESULTS OF DRAINING.—It has been remarked, that "to apply manure to undrained land, is to throw money away," an illustration of which is furnished by a statement in the Transactions of the New-York State Agricultural Society, where seven acres of low wet land, manured annually at the rate of 25 loads to the acre, produced 31 bushels of oats per acre; but after being thoroughly underdrained at a cost of about 60 dollars for the whole, the first crop of oats without manure, was 89½ bushels per acre.

DEEP AND SHALLOW DRAINING.—Gen. Cushing stated at one of the Boston Agricultural meetings, that when draining was first introduced into Scotland, the drains were made about one and a half to two feet deep, and about 18 feet apart. After 10,000 miles were laid, it was found that they were not sufficient. Then they were made from two and a half to three feet deep, and forty feet apart. This system cost less, and was more efficient. Greater depth with greater distance, was again unfavorable.

DRAINING IN INDIANA.—Gov. Wright, in his address before the Wayne county Agricultural Society, estimates the amount of marshy lands in Indiana at three million acres. These were generally avoided by early settlers as being comparatively worthless, but when drained they become eminently fertile. He says, "I know a farm of 160 acres that was sold five years ago for $500, that by the expenditure of less than $200, in draining and ditching, the present owner refuses now $3000." Again, he says, "I have a neighbor who informed me that in 1850, a very dry sea-

son, he had ditched a field that he had previously put in corn; in the low and wet parts of the field he usually gathered in the fall a few nubbins, but went to the high ground for his crop. In the fall of last year, he obtained his best corn from the low land, his worst from the high; and the *extra* crop of the year paid for the whole expense of ditching."

ACTION AND REACTION IN FARMING.

Never keep animals on short allowance—if you starve them, they will surely starve you.

Although in draining land thoroughly, your purse may be drained, yet the full crops that follow will soon fill it again.

Trying to farm without capital, is like trying to run a locomotive without fuel. Money and wood must both be consumed, if they are to move the machine of the farm or of the rail.

Always give the soil the first meal. If this is well fed with manure, it will feed all else; plants, animals, and man.

If you wish to give an energetic movement to all your farm machinery, and keep its hundred wheels in rotation, be sure not to be without a good rotation of crops.

If you allow your animals to shiver, your fortune will be shivered in consequence; that is, the farmer who leaves his cattle to the winds, will find his profits also given to the winds.

Heavy carrot crops for cattle, will soon return carats of gold.

Did you ever hear the musical notes of a starving herd of hogs? Extinguish by food those notes speedily, if you would avoid even more annoying notes after pay-day has passed.

Learn as much as possible the experience of the skillful; the man who depends on teaching himself will be likely to receive very poor lessons,—or, as Dr. Franklin has it, he will find "he has a fool for his master."

Fences operate in two ways—if good they are a defence, if poor an offence.

Many a farmer, by too sparingly seeding his new meadows, has had to cede his whole farm.

Every farmer should see daily every animal he has, and inspect its condition. Weekly visits, as with some, soon result in weakly animals.

The man who provides well sheltered cotes for his sheep in winter, will soon find plenty of coats for his own back.

A good housewife should not be a person of "one idea," but should be equally familiar with the flower garden and flour barrel; and though her lesson should be to lessen expense, yet the scent of a fine rose should not be less valued than the cent in the till. She will doubtless prefer a yard of shrubbery, to a yard of satin. If her husband is a skillful sower of grain, she is equally skillful as a sewer of garments; he keeps his hoes bright by use; she keeps the hose of the whole family in order.

"Manure is money," and "short paper" is like a short plant;—a note at bank matures by falling due,—an oat in the field also matures by falling dew—but they will be found in both cases shorter than wanted, unless the fiscal bank and the bank of earth both receive timely deposits.

To abuse animals by starving them, is as base as the hope of gaining by it is baseless.

EFFECTIVE ACTION OF MANURES.

Nothing has had a more retarding influence on the success of chemical agriculture, than the error which has been so frequently committed, of calculating and pronouncing with precision in advance, the result of the application of mere theoretical estimates. Farmers have been told that analysis would show the exact composition of their soil, and its wants; that if any ingredient should be deficient, the chemist could point out with the accuracy of mathematics, the substance and the quantity that would restore its fertility, without resorting to the random and empirical course of applying a whole set of fertilizers in the shape of common manure. Experiments of this sort have been abundantly tried; a few have succeeded, and these have been widely published; most of them have failed, and the failures have slowly found their way among the intelligent portion of the farming community.

We admit that at first view, the chemical theory appears exceedingly plausible, and promises the most satisfactory results. But there are a number of circumstances that were inadvertently overlooked, and which, had they been taken into account and properly appreciated, would have furnished the strongest grounds for doubting this beautiful theory.

Far more important than the mere presence of fertilizing ingredients, or even the *chemical condition* of those ingredients in many cases, is their mechanical texture and degree of pulverization. We have elsewhere given an instance, furnished by one of the most eminent scientific and practical cultivators of our country, where the complete crushing of the clods of an adhesive soil, and grinding together with them into powder the manure applied to the land, produced an effect upon the subsequent crop *five times* as great as the ordinary operation of manure. How absurd it must be to make strict calculations on the result of a given quantity of yard manure, without ever inquiring into the mode of application—whether on the one hand by spreading in large unbroken lumps, carelessly and imperfectly plowed under, and in a condition wholly useless for plants, or even detrimental in case of drouth—or on the other by a thorough harrowing of the soil and manure together, before turning under, and a repetition of the operation when necessary afterwards for complete intermixture. We have known the most admirable results by this practice, where nothing but fresh coarse manure could be obtained for succulent garden crops, and nearly a total failure under like circumstance without its performance. Even the time of year that manure has been carted on the land, has sometimes had an injurious bearing on the success of its application, simply by the packing and hardening resulting from traveling over its surface when in a wet and adhesive condition. It is a perfectly self-evident truth, that a mixture of unburnt bricks and clods of manure, would afford immeasurably less sustenance to the fine and delicate fibres of growing plants, than the same mixture ground down together into a fine powder. Hence it may be reasonably believed that the general introduction and free use of pulverizers, as the most effective harrows, clod-crushers and subsoilers, assisted by tile-draining, may be of greater benefit to the whole country than the importation of a million tons of guano.

The chief reason of the extraordinary results of liquid manuring, is the complete manner in which the enriching particles are diffused while

in solution through every part of the soil. We here allude to the later mode, which consists in mixing the solid parts of manure thoroughly and freely through large volumes of water, and not to the old mode of applying the liquid portions merely of fresh manure, which impoverishes the land of phosphates and lessens the organic matter, and hence has been mostly discontinued. The only doubt of the propriety of the more improved mode of applying liquid manure, is on the score of cost in cartage; it is unquestionably much better than the common mode of manuring, but is probably less economical than solid application in connection with finely pulverizing by repeated harowing.

In addition to the state in which manure exists in the soil, there is another consideration of much importance in relation to its best and most economical use. Succulent crops, as turnips and cabbages. are rapid growers and require rapid feeding; hence, manure which has undergone a considerable degree of fermentation, is found to effect this purpose to better advantage than fresh or entirely unfermented manure. Wheat crops on the contrary, are of more moderate growth, and less rank feeders, and consequently need a less profuse supply. To apply large quantities rich in ammonia to such crops as do not need it, would of course result in waste, and different applications to large feeders would give scanty products. The adaptation of the amount to the specific purpose intended should therefore not be overlooked in estimating the effective value of a given quality.

In making the preceding remarks, we wish to be distinctly understood as not wishing to set aside in practical farming, an investigation of the composition and knowledge of the deficient or missing ingredients of soils, as well as the restoration of these by special manures. But independently of several difficulties arising from the variable nature of the soil of the same field, and the very different results in growth, which a slightly different chemical condition of those ingredients may give, showing that all the suggestions of science in chemical agriculture must be submitted to rigid experiment—independently of these considerations, all experiments based on the analysis of soils and the use of fertilizers whose constituents are determined, which do not take into full consideration their mechanical texture, can not fail to result in the utmost uncertainty. When, in addition to this, it is remembered that a large portion of the fertility of many of the best soils of the country, are in a great degree lost by their coarse and miserable mechanical condition, resulting from hasty and imperfect tillage and from the want of thorough underdraining, it must be admitted that while much of the attention of scientific farmers has been directed to chemical inquiry, too little, far too little, has been given to the thorough pulverization and intermixture of the rich ingredients which they already possess.

Brush Drains.—Where stones are scarce, and tiles not easily obtained, brush drains are an excellent substitute. They are, in fact, the cheapest of all kinds of underdrains, on account of the rapidity with which they may be filled. The brush, being excluded from the air, will last a long time. Judge Buel's were found after 20 years, apparently as good as when made.

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

COUNTRY DWELLINGS.

NO part of rural economy is more important and requires more skill, than the erection of dwellings in the country. It is a low estimate, that the farm houses of the Union have cost five hundred millions of dollars. Of this amount, at least one hundred million has been entirely wasted by bad arrangement and bad calculation. In addition to this waste, there is a large annual loss by the inconvenient position of rooms, greatly increasing the labors of the family. The evil is owing to the national fault of Americans—hastiness and imperfection, and a superficial character in all they undertake. Every man thinks he can plan his own house with only a few hours examination and contrivance. On the contrary, years of study are required to understand properly the disposition of every part. A house which consists of ten apartments, large and small, may be arranged with these apartments in an almost infinite number of variations—or, according to arithmeticians, in more than three million different ways. A whole lifetime may therefore be devoted in studying the best construction among such a multitude of forms.

With so endless a subject, and so little time usually given, it is no wonder that most houses are badly arranged. We once stopped to see an acquaintance who had just occupied a new dwelling of his own planning—or, more properly speaking, it had no plan; for, among other queer specimens of convenience, it became necessary for the guests, in passing from the parlor to the dining-room, to pass out through the front door, and into the building again at a side door. In another instance, a neighbor had so arranged his rooms that the parlor was entered through the kitchen. The arrangements for performing household work in these two dwellings were equally convenient. They were well described by a slight variation in the words of Pope—"A mighty maze, and *all* without a plan."

Most of the designs furnished by amateurs for the agricultural papers, are in a greater or less degree marked by various defects. Their authors, observing their great superiority to the common specimens, perhaps rate their intrinsic value much too high. A book is greatly needed, devoted exclusively to the subject of the *internal convenience* of dwellings, with a full set of *rules*, properly explained, for the arrangement of all the parts. Some of these rules would be so important as to remain fixed and unal-

terable, in all practicable cases; others might be modified, or discarded, with the force of circumstances. We do not know the architect fully qualified for this task. If he is living, he is a *rara avis*. Furnishing designs for neat and tasteful *exteriors* is not so difficult, although we have a profusion of specimens of bad taste, even here, all through the country. A great improvement has been effected through the influence of the several works on rural architecture published of late years, although their teachings have rather verged on the fantastic than the neat, tasteful and simple; and those who have been very desirous to have *fashionable houses*, have carried these peculiarities to such an extreme as to result in the conceited and outlandish.

Another evil, which is becoming common, is *expensive* building. In riding lately through the suburbs of one of our cities, a resident informed us that a large portion of the prominent men of the place had failed, or become embarrassed, through the desire to excel their neighbors in splendid residences. We are not sure that our writers on this subject are not partly at fault in this particular. We have just looked through *four* American works, published within a few years—works whose leading characteristic ought to be republican simplicity—and find in one, (Downing's,) many country houses varying in cost from *seven* to *ten* and *ten* to *fourteen thousand dollars*, and another, (the most expensive,) with the cost not given. In the "Homes for THE PEOPLE," (Wheeler's,) there are a considerable number ranging at nearly all sums from *ten* to *thirty thousand dollars;* while the *average* of all, including even the log dwellings, is *six thousand*. Another recommends *a four-story ten thousand dollar cottage* (!!) for its cheapness; and the fourth work, less faulty than the others, has several designs for farm houses costing from four to eight thousand.*

"But if the wealthy are able to build such houses," we are told, "let them build accordingly." By no means, we would say—for every man, as a patriot and a christian, has a duty to perform to the community, during his rapid passage through the world; and if he sets an example of extravagance for his poorer neighbors, which they, in their desire to be "as good as their betters," are led improperly to follow, he is effecting a positive and serious evil. Many of the hard struggles and heavy debts of young heads of families, arise from the wish to be equal with their friends in their fine rooms, costly carpets, and silver furniture. We question if any man, however rich, has a right to build a ten thousand dollar dwelling, with these influences in view, when comfortable simplicity would be so much better than showy luxury; and the expenditure of means in the purchase of books and scientific apparatus, in the dissemination of knowledge, and in promoting the substantial welfare of the world at large, would be better than the indulgence of the feeling that is expressed in the language, "Soul, thou hast much goods laid up, and a very fine house indeed to keep them in—enjoy it, and let others admire."

A disposition to copy extravagance runs through all ranks. Hence the

* In the county of Seneca, N. Y., which may be taken as a fair example of the best and wealthiest farming portions of the country, there are *fifteen times* as many farms under two hundred acres as over that quantity; more between fifty and a hundred acres than of any other dimensions; and nearly three times as many under a hundred as over a hundred acres. There are only *twelve* farms, out of more than twenty-three hundred, that contain over four hundred acres. Hence, we may safely conclude that the great mass of the landholding community, need very moderate plans for the erection of their dwellings.

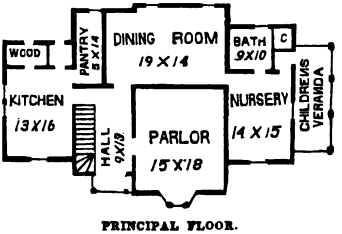
great number of examples where farmers have built large houses and run themselves in debt, so that they could neither conduct their farming operations to advantage, nor make improvements by planting. There have been multitudes of instances where houses costing three thousand dollars have used up every available resource, when a cheaper erection of two thousand would have supplied as well every *real* want, and left a surplus of one thousand, a fifth part of which would have embellished the place by planting, furnished a profusion of comforts in the form of fine fruits, and in the end rendered the home not only more comfortable in every respect, but really of more moneyed value than the bleak three thousand mansion, with its broken fences and bare walls.

Our object is to contribute,—even if it be in a small degree,—to the correction of these evils; to furnish cheap and tasteful designs, obviating any necessity for extravagance; and to encourage those of large means, instead of throwing their money away on luxuries, to show that although they *can* build showy houses, they prefer something that shall leave the world better than they found it. We should delight to set our eyes upon the man, who, with a hundred thousand dollars or more at command, would be willing to live in a dwelling worth two thousand, that he might have ampler means for the benefit of his race.

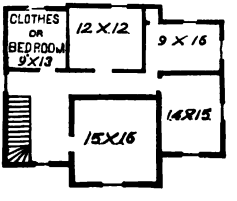
GOTHIC COUNTRY HOUSE.

In order to avoid the fault of the common gothic cottages, seen in all parts of the country, namely a profusion of flimsy ornamental carvings, we present the accompanying view (page 168) of a simple, well-proportioned, and sufficiently tasteful country residence, which may be afforded by most farmers in comfortable circumstances. It need not cost, if built of stone or brick, more than twenty-five hundred dollars; and with wood, eighteen to twenty hundred, might be sufficient for its completion.

Its exterior needs very little description. There is little or nothing about it which is added purely for ornament, and this materially lessens the expense of erection. The steepness of the roofs prevents danger of leakage at the receding angles, while this quality is not too glaring to detract from its neatness.

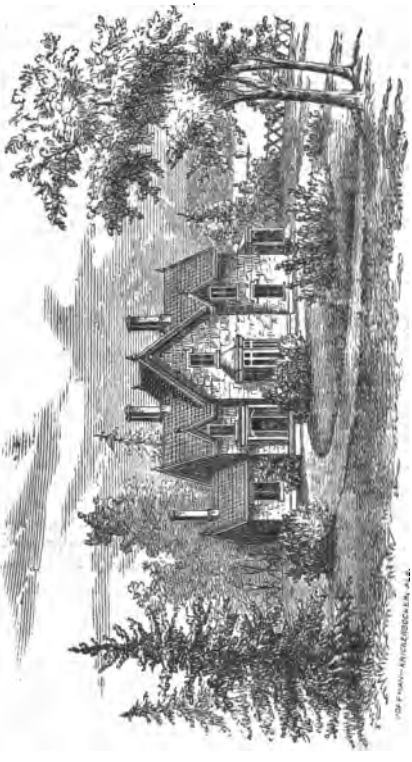


PRINCIPAL FLOOR.



SECOND FLOOR.

The plans of the interior nearly explain themselves. From the hall, or entrance, ready access is had to the parlor, dining-room, and kitchen. while the latter is rendered less conspicuous by the intervening stairs.



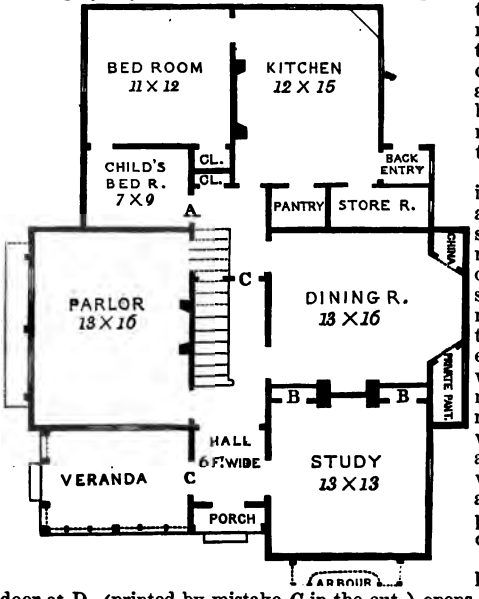
GOTHIC COUNTRY HOUSE.

The dining-room is longer and narrower than common—a more convenient form for its usual purpose; it is, of course, intended in this moderate plan to serve as a family or ordinary living-room. The bath room may be used, if desired, as a children's bed-room. It will be observed that special attention is given to the comfort of children, by providing them with a pleasant veranda, instead of attaching it to the parlor, a room far less frequently used, and used too by those who can well forego a little comfort for a most interesting class of the human race, quite as much deserving, but too often thrust aside to make room for full-grown loungers.

A small wood-room is appended to the kitchen—a detached wood-house having been found best, being less noisy, and supplying less dirt and litter. The wood-room is occasionally filled from it. The chamber over the kitchen may be finished if needed, for the hired man or domestic, and reached by a small separate flight of stairs.

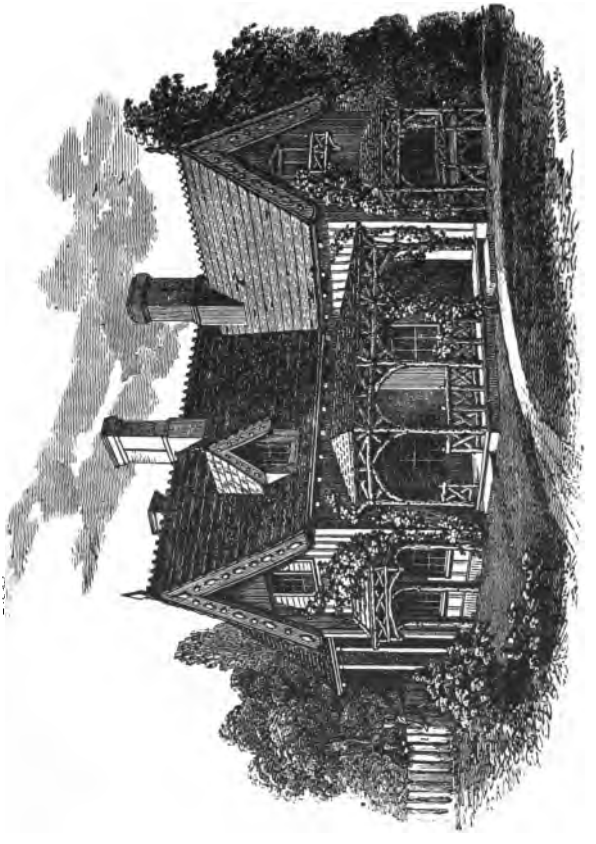
COTTAGE GOTHIC FARM HOUSE.

This was originally furnished in the *Horticulturist*, as a design for the cheap residence of a country clergyman; but it may be adopted as a farm dwelling by any one who wishes to obtain a large amount of accommodation with moderate means, and whose intellectual habits require a *study*, or separate apartment, for books, papers, specimens in natural history, &c.



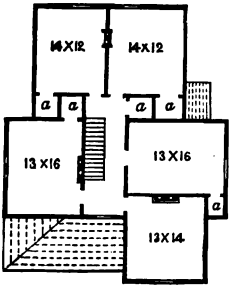
The cottage Gothic is given in the view—as adapted to rural scenery, and giving more room for its cost than any other style. The rustic veranda and trellis, for the support of climbers, and for giving the whole an interesting rural appearance, are made of cedar poles with the bark on, and are thus erected at a very trifling expense, and are more appropriate than any elaborate carpentry.

The plan needs but little explanation. A door at D, (printed by mistake *C* in the cut,) opens on the veranda, and



A COTTAGE GOTHIC FARM-HOUSE.

REAR VIEW.



CHAMBER FLOOR.

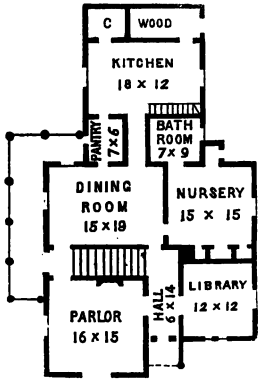
another at C shuts off the back entry from the front hall. The study is fitted with book cases at B B; the living-room has convenient closets, so placed as to form a kind of bay-window effect, quite pleasing in appearance. The door between the child's bed-room and the back entry is glazed, to admit light to the latter. If desired, the closets between the entry and bed-room may give place to a door.

The second-floor plan (drawn on a smaller scale) shows five good bed-rooms, with a closet to each. A sketch of the rear is given, showing the back porch and arrangement of the kitchen wing.

The whole may be constructed of wood,—where materials and labor are not very costly,—in a simple manner—the inside walls to be whitewashed or neatly papered—the first story 9 to 10 feet high only,—for about $1,200.

ITALIAN COUNTRY HOUSE.

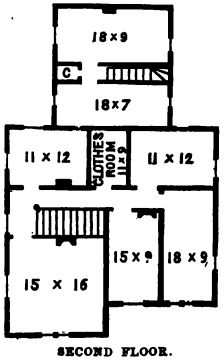
The design here given represents a country residence which contains nearly all the essential comforts for a family residing on a farm, at a less cost than a large portion of the heavy built pseudo-Grecian farm houses. The exterior indicates entire simplicity, with a sufficient degree of architectural character, and the interior is a combination of convenience and compactness.



FIRST FLOOR.

From the entrance hall direct access is obtained to the parlor, library, and dining-room, and, if desired, the nursery may be entered from the same quarter, by placing a door at its inner extremity. The stairs between the parlor and dining-room, leave a small entry directly under the landing, through which the veranda is reached from these two apartments. The pantry, being placed between the kitchen and dining-room, affords the most ready access from both; and the bath-room between the nursery and kitchen admits the easy heating of water for its use, by the kitchen fire. A closet (marked C) is provided for the coarser utensils; and a small wood-room adjoining the

ITALIAN COUNTRY HOUSE



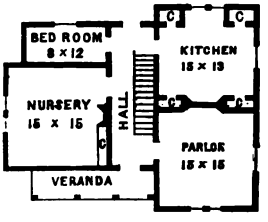
SECOND FLOOR.

kitchen back door, is easily filled from without for convenient kitchen use—the wood-house in which it is stored for a year's seasoning being a coarser detached building. The cellar is entered near the kitchen passage, beneath the stairs to the kitchen chamber. It may be likewise entered from the dining-room by a flight under the main or hall stairs, if the inconvenience of litter in this direction may be avoided.

The cooking-stove may be placed near the back or further side, the pipe passing into the flue in the chamber above. The dining-room, (also used as the family room,) is similarly warmed by a stove beneath the chimney on the second floor. This chimney and the one in the parlor are brought together and united in the small garret by being built in *an arch*, which is the most easy and secure way of drawing chimneys horizontally aside The cost of this dwelling, well built, in a plain, substantial manner, will not vary much from two thousand dollars.

ITALIAN FARM COTTAGE.

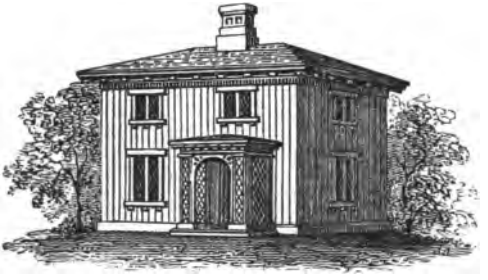
For a smaller sized country or farm house, combining something of the characteristics of the tasteful cottage with a convenient home arrangement, we furnish this design. With the exception, perhaps, of the arched veranda, there is no exterior ornament whatever. It will be observed that the roof is steeper than in Italian houses generally, giving more room in the chamber apartments, and preventing danger of leakage. This steepness can be only adopted in one-and-a-half story houses, as it would impart too heavy an appearance to any other.



There are three principal rooms below, besides a small bed-room, and there may be four above, one each over the parlor and kitchen, and two over the nursery. This plan possesses some important advantages, among which we may mention the convenience of a hall extending through the house, without occupying much space, from which every room on the ground floor is entered. The chimneys being near the centre, but little heat is lost through the outside walls. The kitchen has four closets, (marked *c*,) and the nursery one.

In such cases as do not require a *nursery*, the parlor may be changed to a dining and living room, and the present nursery transformed into a neat and comfortable parlor.

The cost of this house will vary, with the price of materials, from $1,200 to $1,500. With larger rooms and a better finish, its cost may run up to $2,800.



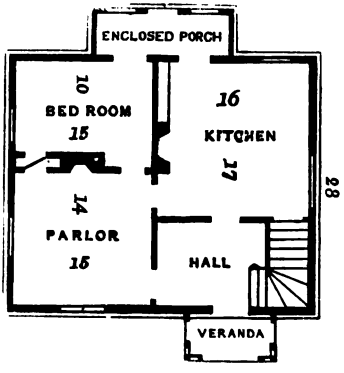
SQUARE FARM COTTAGE.

This design furnishes nearly the accommodation of the preceding, but being simpler in form and more compact in arrangement, it may be built at considerably less cost. It was originally given in Downing's *Horticulturist*. It is intended to be built of wood, the weather boarding being vertical, a mode now becoming well known, and the rafters projecting eighteen inches form brackets of the plainest description, and yet give a better appearance to the roof than the usual common-place character. The trellis-work porch, to be covered with climbing plants, adds much to the ornamental appearance.

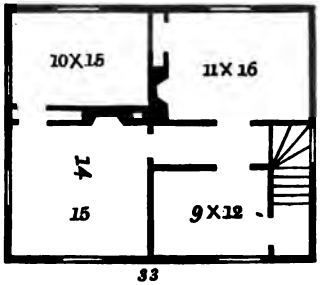
The accompanying plans render any particular description of the interior unnecessary.

The flues of the two chimneys are drawn together into one in the garret.

Downing gives the estimated cost of erecting this dwelling, (at Newburgh,) at $760—supposing it to have a cellar under the whole and to be filled in with brick; the lower rooms being ten feet high, and the upper ones nine feet. Everything would, of course, have to be made of the cheapest character; but if made so that the cost should extend to one thousand, it would probably prove more satisfactory to most who might adopt the plan. Its square and simple form contributes very much to economy in erection.



FIRST FLOOR.



CHAMBER FLOOR.

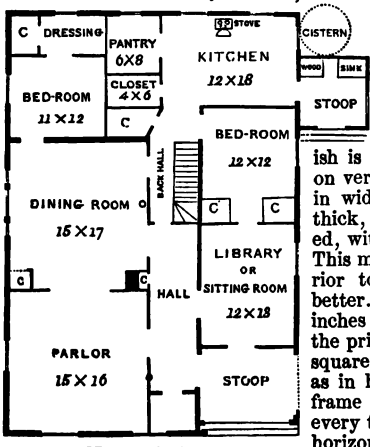
SUBSTANTIAL FARM RESIDENCE.

The accompanying plan was furnished by a correspondent, to which we have added a perspective view in accordance with his design. With one or two defects, this combines a large number of conveniences. A principal object is to afford a separate entrance into every principal room without the too common fault of passing through some other room to reach it. The house is 24 by 36 feet, besides the additional lower portion, which is 13 feet wide at the side and 16 feet at the end. The parlor and dining-room are connected by sliding doors. The position of the other rooms is easily seen in the plans. The following is our correspondent's description:—

A front and back hall, with stairs in back hall for access to chambers, and underneath to cellar, answering as private stairs. or for all purposes for a family, being much more economical than open stairs, and which are so placed as to accommodate all parts of the house. From this hall is a door opening into a closet at the end of the hall, and also a door (with sash to light back hall,) opening into the kitchen. Connected with the kitchen is a pantry, 6 by 9 feet; a closet, for kettles, &c., 6 by 4 feet, and an entry, 7 by 8 feet, in which is a sink, with a pump to raise water from the cistern underneath. The sink should have a good drain, to carry off the waste water. On the right, in the front hall, a door enters a sitting-room or library, 12 by 13 feet, from which a door enters a bed-room, 12 by 12 feet, with two closets opening into it. A door may lead from the bed-room into the back hall or kitchen, if desired. All the rooms in the lean-to part, are

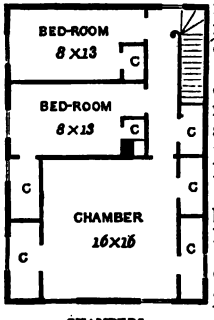
designed to be 9 feet in height. Up stairs are two bed-rooms, 8 by 13 feet each, and a chamber, 16 by 16 feet, and 9 feet in height, with any reasonable number of closets.

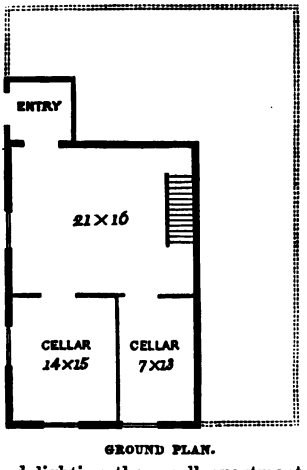
The cellar is under the main part of the building, which gives as much cellar room as is usually wanted; if more is desired, it can be had by excavating under the lean-to part. The chimneys are ornamental, which, with the verge boards under the eaves, gives a finish to the building in good keeping with the idea of a cottage or country house. The outside finish is of inch boards, matched and put on vertically, with battens four inches in width, and not less than one inch thick, rough or plain, painted and sanded, with a coat of paint over the sand. This makes a handsome finish, far superior to clap-boards, and looks much better. In framing, use timber 5 by 10 inches for posts and girth beams, and for the principal floor, timber eight inches square; instead of framing in scantling as in houses covered with clap-boards, frame scantling three and four inches every three feet upward from the sill, horizontally—the four inch side next the outside covering. On these nail boards vertically inside, to lath and plaster upon; then furr out with inch boards over the plaster, and put on another coat of lath and plaster—making a double coat of plastering all around the outside or exposed part of the building. This makes a house much warmer, and the extra



PRINCIPAL FLOOR.

expense is soon saved in fuel. The timbers each side of the windows, are six by five inches. By using such timber, the projections in the corner of the room as in case of square timber being used, is avoided, and is sufficiently strong. By nailing cleats to the joists, and cutting in short pieces of boards between them, and putting upon this one or one-and-a-half inches of mortar, before laying the floors in the principal story, it will tend to keep out the dampness from the cellar and add to the warmth of the house.





—The principal defect in this plan is, the *half-window* in the extreme corner of the parlor.—We should prefer giving this room the full benefit of both windows, and lighting the small apartment at the end of the hall, if necessary, from under the veranda. The pantry should be easily accessible from both kitchen and dining-room, which may be easily accomplished by a slight alteration of kitchen closets.

We are not furnished with the cost of this building, but should estimate it at from eighteen to twenty-two hundred dollars, varying with cost of materials, finish, &c.

GENERAL RULES FOR BUILDING.

The following, which are a few of the rules to be observed in building houses, may afford some useful suggestions to those about to engage in such undertakings.

1. Always compare the *cost* with the *means*, before deciding on the plan. It is much better to build within means, than to have a large, fine house, hard to keep in order, and encumbering the owner with a heavy and annoying debt. A great error with many is an attempt to build *finely*. Attend to *real* wants and substantial conveniences, and avoid imaginary and manufactured desires.

2. Study a convenient location rather than a showy one; a house on a lofty hill may make a fine appearance, but the annoyance of ascending to it will become greater on each successive day.

3. Build of such good materials as are near at hand. An intercsting index is thus afforded to the resources and materials of that particular region, with the addition of great economy over the use of such as are "far brought and dear bought."

4. Prefer lasting to perishable materials, even if more costly. A small well built erection, is better than a large decaying shell.

5. Discard all gingerbread-work, and adopt a plain, neat, and tasteful appearance in every part. Far more true taste is evinced by proper forms and just proportions than by any amount of tinsel and peacock decorations. A marble statue bedizened with feathers and ribbons, would not be a very pleasing object.

6. Where convenient or practicable, let the plan be so devised that additions may be subsequently made, without distorting the whole.

7. In all *country* houses, from the cottage to the palace, let the kitchen (a most important apartment,) always be on a level with the main floor. It requires more force to raise a hundred pounds ten feet upwards, whether it be the human frame or an assortment of eatables, than the same weight one hundred feet on a level. To do it fifty times a day is a serious task. If the mistress superintends her own kitchen, it should be of easy access.

8. Every entrance from without should open into some entry, lobby, or hall, to prevent the direct ingress of cold air into rooms, and to secure sufficient privacy.

9. The first floor of any house, however small, should be at least one foot above ground, to guard against dampness.

10. Flat roofs should be adopted only with *metallic* covering. Shingles need a steeper inclination to prevent the accumulation of snow, leakage, and decay—more so than is frequently adopted. A steep roof is, additionally, cheaper, by admitting the use of a less perfect material for an equally perfect roof, and giving more garret room.

11. More attention should be given to the convenient arrangement and disposition of rooms in constant daily use, than those employed but a few times in the course of a year. Hence, the kitchen and living-room should receive special attention.

12. Every cellar should have, besides the stairs within, an outside entrance, for the passage of barrels and other heavy articles.

13. The coolest rooms in summer, and the warmest in winter, are those remote from the direction of the prevailing winds and from the afternoon sun. Hence parlors, nurseries, and other apartnents where personal comfort is important, should be placed on this side of the house where practicable.

14. The pantry, and more especially the china closet, should be between the kitchen and dining-room, for easy access from both; and the bath-room between the kitchen and nursery, for convenience to warm water. The kitchen should have opposite windows, for full light, and for securing a current of air in summer.

15. Brick and stone houses should always be lathed and plastered inside, so as to leave a confined portion of air in the wall, to prevent dampness.

16. *Unburnt* brick should not be used for "filling-in" wooden houses, as rats are frequently known to cut through them.

17. To prevent rats from burrowing into cellars, either make a good water-lime floor, or else build the wall on a close-jointed flagging, laid some inches below the bottom of the cellar, and projecting three or four inches beyond the wall. The rat burrows down next to the wall, reaches the flagging, and cannot pass through it, never in any case working back to the edge.

18. In erecting brick walls place strips of lath *between* the courses, and not thick blocks *in* the courses, for nailing to. The former will bind the walls together, and only become firmer by the entrance of the wedge-form nails; the latter are very liable to become loosened.

19. The two corner furring pieces of rooms should be very securely nailed together, to prevent the plastering from cracking at the corners.

20. Always reserve ten per cent. of cost for improvement and planting. Remember that a hundred dollars in trees and shrubbery produce a greater ornamental and pleasing effect than a thousand in architecture.

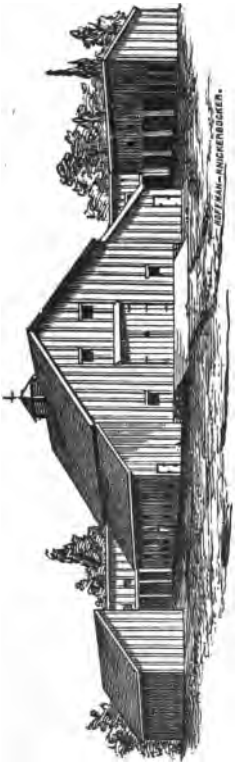
21. Lastly, *never build in a hurry;* mature plans thoroughly; procure the best materials, and have joiner-work done at the cheaper season of winter, and the erection will be completed in the most perfect manner, and with the greatest practicable degree of economy.

LEWIS F. ALLEN'S BARN.

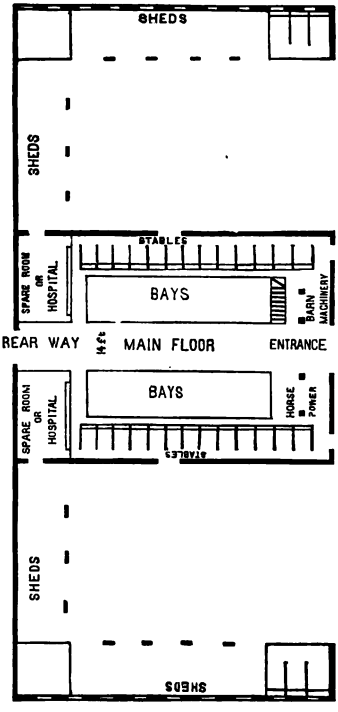
The frequent inquiries made of us for plans of barns and farm buildings, induce us to give a condensed description of those recently erected by Lewis F. Allen, on his Grand Island farm, a full account of which is published in the last volume of the Transactions of the New-York State Agricultural Society. This plan has many conveniences, and, although very large, possesses the important advantage of admitting almost any required reduction in size. The plan and views, which in the original occupy four full pages, have been diminished, so as to give all that is essential in the accompanying figures—the view occupying less space by being seen more nearly from the front. By lettering the plan, some pages of description are obviated.

The body of the main barn is 100 feet long by 50 feet wide, the posts 18 feet high above the sill, making 9 bents. The beams are 14 feet above the sills, which is the height of the inner posts. The position of the floor and bays is readily understood from the plan. The floor, for a *grain* barn is 14 feet wide, but may be contracted to 12 feet for one exclusively for hay. The area in front of the bays is occupied with a stationary horse-power and with machinery for various farm operations, such as threshing, shelling corn, cutting straw, crushing grain, &c., all of which is driven by bands from drums on the horizontal shaft overhead, which runs across the floor from the horse-power on the other side; this shaft being driven by a cog-wheel on the perpendicular shaft round which the horses travel.

We would suggest an addition to the machinery, not mentioned in the description. In a barn like this, holding a hundred tons of hay, the labor of pitching up to the upper part of the bays is formidable. We would therefore propose the use of an *elevator*, like that of the best modern threshing machines, to be worked by the two horses removed from the loaded wagon of hay to the horse power, during the pitching off of the load. This would greatly lessen the labor and quicken the operation of unloading. The same elevator would be used in carrying threshed straw from the machine to the bays. The simplest and best elevator for this purpose is made of a light, inclined board platform, four feet wide, on each side of which a rope or endless chain runs, connected by cross-bars, a foot or two apart, which slide over the upper surface of this platform, and sweep the hay upward as fast as pitched upon it.



LEWIS F. ALLEN'S BARN.



GROUND PLAN.

A passage four feet wide extends between the bays and the stables, which occupy the two wings. This extends up to the top of the bays, down which the hay is thrown for feeding, which renders this work as easy and convenient as possible.

The floor of the main barn is three feet higher than that of the stables. This will allow a cellar under it, if desired—or a deeper extension of the bays—and it allows storage lofts over the cattle, with sufficient slope of roof. A short flight of steps at the ends of each passage, admits easy access from the level of the barn floor.

The line of mangers is two feet wide. A manure window is placed at every twelve feet. The stalls are double; that is, for two animals each, which are held to their places by a rope and chain, attached to a staple and ring at each corner of the stall. This mode is preferred to securing by stanchions. A pole or scantling, placed over their heads, prevents them from climbing with their feet into the mangers, which they are otherwise very apt to do.

The sheds, which extend on the three sides of the barn, and touch it at the rear end, are on a level with the stables. An *inclined plane*, from the main floor through the middle of the back shed, forms a rear egress for wagons and carts, descending three feet from the floor. The two rooms, one on each side of this rear passage, 16 by 34 feet, may be used for housing sick animals, cows about to calve, or any other purpose required. The stables at the front ends of the sheds are convenient for teams of horses or oxen, or they may be fitted for wagon houses, tool houses, or other purposes. The rooms, 16 feet square, at the inner corners of the sheds, may be used for weak ewes, lambs, or for a bull stable.

Racks or mangers may be fitted up in the open sheds for feeding sheep or young cattle, and yards may be built adjoining, on the rear, six or eight in number, into which they may run and be kept separate. Barred partitions may separate the different flocks. Bars may also enclose the opening in front, or they may, if required, be boarded up tight. Step ladders are placed at convenient intervals, for ascending the shed lofts.

A granary over the machine room is entered by a flight of stairs. Poles extending from bay to bay, over the floor, will admit the storage of much additional hay or grain. As straw cannot be well kept when exposed to the weather, and is at the same time becoming more valuable as its uses are better understood, we would suggest that the space on these cross poles be reserved for its deposit from the elevator from threshing grain, or until space is made for it in one of the bays.

A one-sided roof is given to the sheds, (instead of a double-sided,) to throw all the water on the *outside*, in order to keep the interior of the yards dry. Eave-troughs take the water from the roofs to cisterns. The cisterns, if connected by an underground pipe, may be all drawn from by a single pump if necessary. The quantity of water thus afforded appears to be much under-estimated in the article accompanying the description, where it is stated to be *five hogsheads* per annum from a roof of ten feet square. Now, instead of this small amount, no less than *thirty-six* hogsheads are yielded by three feet of water, the average annual fall in the Northern and Middle States—as a computation will at once show. The whole roof of the buildings, of the size here given, has over 12,000 square feet of surface, if we estimate correctly; this would give, as a daily average, twelve hogsheads of water, or twenty-four barrels—enough to water

nearly a hundred head of cattle the year through. But if the cistern water were only used during the drouth of summer, there would be enough for three times this number. But as the whole yearly amount would be over four thousand hogsheads, the cisterns should hold at least a fifth of this quantity, if used constantly, or more than half this amount if used only in summer. Very few men would make them one quarter the required capacity. This is a thing singularly overlooked.

An important advantage of placing the stables in the wings of the barn is, that it obviates the common objection that liquid manure from the stalls rots the sills—the stable sills being comparatively easily replaced if not under the main barn.

This barn is the re-construction of an old one, the convenience of which has been proved by twenty years' use by the owner, who is so well known as one of the best and most enlightened of distinguished American farmers.

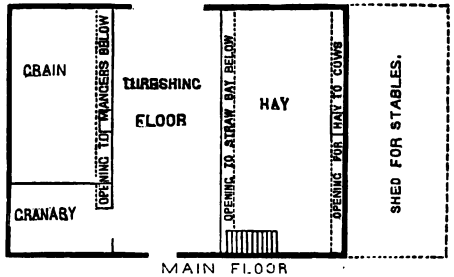
We wish to add, before concluding, a single remark on the manufacture of composts, alluded to in the description of the barn. Drawing out manure frequently, spreading and plowing in at once, are recommended in preference to composting. But as this is impracticable all times of year, we have found a better way, to draw out often, and, instead of applying at once, to compost it *in the field* where wanted, by alternate layers with fence-corner turf, plowed sods, &c. These retain all the volatile parts, and all the advantages of rotted manure are secured, with no extra *drawing of heavy materials*

SIDE-HILL OR CELLAR BARN.

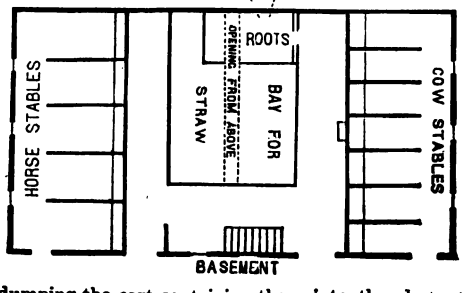
The object of this plan is to furnish a good barn for a farm of moderate size, or of about seventy-five to one hundred acres, occupied with mixed husbandry, but where raising animals, dairying and grazing have a full share. This barn will accommodate five horses, seven cows, and will afford shelter for a large quantity of hay and grain in the straw, and has a

bay for straw, and a cellar for roots below. A carriage-house, tool-room, &c., are supposed to be nearer the dwelling, and small sheep barns are built separately, consisting simply of a twenty-feet-square box and roof for hay, with a low shed at one side, and a space beneath it for sheltering the sheep.

The main portion of this barn is about 30 by 40 feet. The plan showing the main floor nearly explains itself. On one side of the threshing floor is



a bay for unthreshed grain, with a granary adjoining, and on the other is a large bay for hay. Timbers or poles across from beam to beam overhead, will admit the storage of a large quantity of corn fodder, hay or grain.—Beneath the grain bay, (as the basement plan exhibits,) is the horse stable, the mangers of which are filled and the grain troughs supplied through an opening from the main or threshing floor. On the other side of the floor is a similar opening, for throwing down the threshed straw into the straw bay beneath. On the opposite side of the hay bay is an opening for throwing hay down to the passage in front of the cow-stables. This opening is made by means of a row of studs or poles, placed perpendicularly on that side, three feet from the end of the barn, and the hay, when deposited, is only built out to this line of studs. By means of a flight of stairs from the floor above, easy access may be had from above to the passages in front of the stables. The space in front of the horse-stables, and the doors opening to it outside are sufficiently wide to admit a wagon backed in far enough to be easily loaded with grain through the door above from the granary.



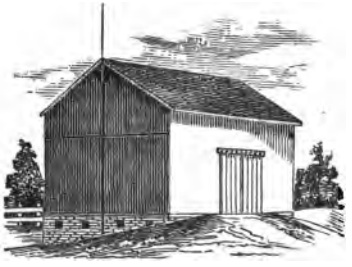
Between the straw bay and the cellar wall, towards the embanked side, is the cellar for roots. This is easily filled by dumping the cart containing them into the shute (shown by dotted lines in the basement plan) placed in the cellar window. They are effectually protected from freezing by being thus placed between the straw on two sides, and the embanked wall on the third, while double walls and double doors, next the cow-stable passage, amply protect them on the fourth. A coating of two or three feet of straw thrown on the top, completely

shuts out the frost from above. The passage next the cow-stables is wide enough to contain the root slicer, straw cutter, &c. The passage at the end of the straw bay may be made wide enough, if desired, to contain the coarser tools of the farm.

Ventilators pass perpendicularly upwards from the horse and cow-stables to the peak of the barn, and are shown in the exteror view.

An advantage results from making the cow-stables in the form of a shed or "lean-to," as it may be built quite separate from the rest of the building; and when the sills decay, which is apt to take place from the large quantities of liquid manure, they are easily renewed, without disturbing the principal frame

SIDE-HILL BARN IN THE USUAL FORM



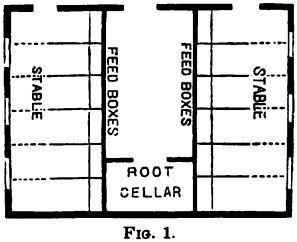


FIG. 1.

Fig. 1 represents the ground plan, 44 feet long and 32 feet wide, 10 feet high—one stable on each end, 14 feet wide, which will give a feed manger 3 feet wide, and a good wide passage in the rear of the animals also. Divided into 6 stalls, 5½ feet wide, each will stable 12 animals, which are to be fed from a space corresponding in width with the manger, on a level with the floor, as will be seen in the floor plan, Fig. 2. This space for feeding from the floor, is made by leaving a space 8 feet wide at the bottom of the bay on a level with the floor, and inclines towards the floor to a bay beam 6 feet high from the floor, so that the space abstracted from the

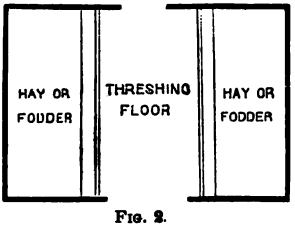


FIG. 2.

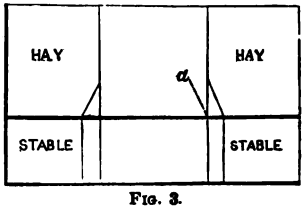


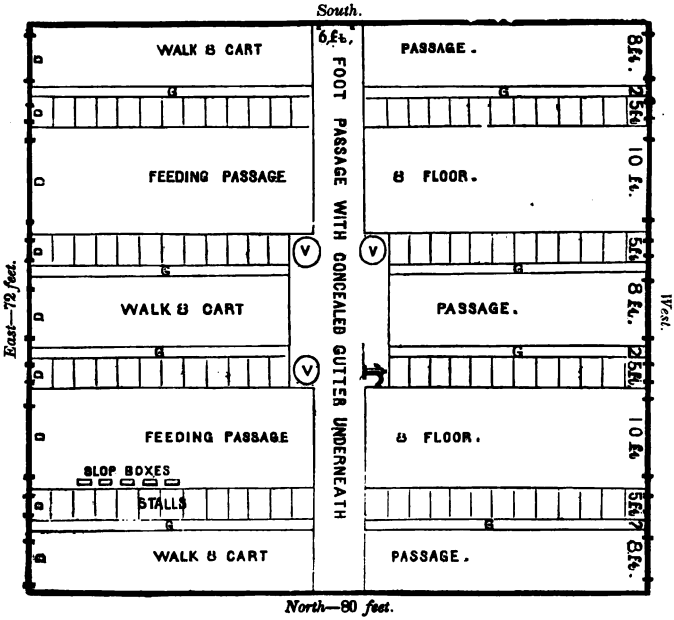
FIG. 3.

bays is but little. This space can be closed or opened at pleasure, by having doors to swing down to the floor when open, or to shut towards the mow when required to be shut, as will be seen in Fig. 3. The dotted line

at *a*, is the side of the bay, inclined, to show the manner of feeding from the floor, and then it can be closed at pleasure. It should be fastened by hinges about two feet high from the floor.

Having a barn nearly on the same plan, I thought it might please some of your numerous readers. B. D. C.

LARGE BASEMENT DAIRY BARN.



A correspondent at Keokuk, Iowa, has furnished us with the plan of a large dairy stable, affording "elegant entertainment" for 92 head of cattle, and is substantially the plan adopted in the best dairy establishments in the Western Reserve, Ohio. The following is our correspondent's description:—

The ground should descend to the south or east, if possible. The entire lower floor, as will be seen, is devoted to stables and fixtures for convenient attendance upon the cows, and consists mainly of two double rows of stalls or stanchions for securing the cows, and two feeding passages and three walks or cart-ways, to facilitate the removal of the manure; also gutters are placed immediately behind the platforms on which the cows stand. To facilitate communication between the different parts of the establishment, a transverse passage is shown, 6 feet in width, and extending the

entire width of the building. Beneath the floor of this passage should be placed an ample gutter for carrying off the liquid from the other gutters, which should terminate in a tank at the south end. Here also would be the proper place for the manure heap, provided the manure is to be removed from the stable by wheel-barrows, for no manure should be allowed to accumulate in the yards frequented by the cows.

Near the centre will be perceived three large vats, or tanks, and a pump. These tanks are for the manufacture of slops, and should be sunk in the ground so as not to freeze, and must be placed so as not to interfere with the cart passage or gutters.

Stanchions three feet apart are the best fixtures for fastening the animals, and the feeding floors should be smooth and clean, and *raised* two or three inches above the platform on which the cows stand. If slop is to be fed, small boxes may be placed with their upper edges nearly even with the floor. The position of the doors is plainly indicated in the plan; also the width of the several parts.

This lower story should be made of substantial materials, and, if of wood, so constructed as to be capable of easy renewal.

The second story is simple and easily supplied, and arranged by any one to suit his own taste and convenience. The most simple and perhaps satisfactory plan would be, to have a threshing floor sixteen feet wide, extending through the centre, the whole width of the building. On each side of this floor, and corresponding with the feeding floors below, should be placed scuttles through which to pass down the hay and fodder. On one side and over the central cart passage, should be placed the granary, with small traps below to supply the slop vats.

In a building of this size, some might prefer two floors instead of one, and a division of the hay bays. This, as well as a thousand other little things, may be left to the taste of the proprietor.

The walls of this story should be carried high enough to hold enough fodder for the entire stock the whole season, which, if the roof be carried up in the usual way, may be no more than eight or ten feet.

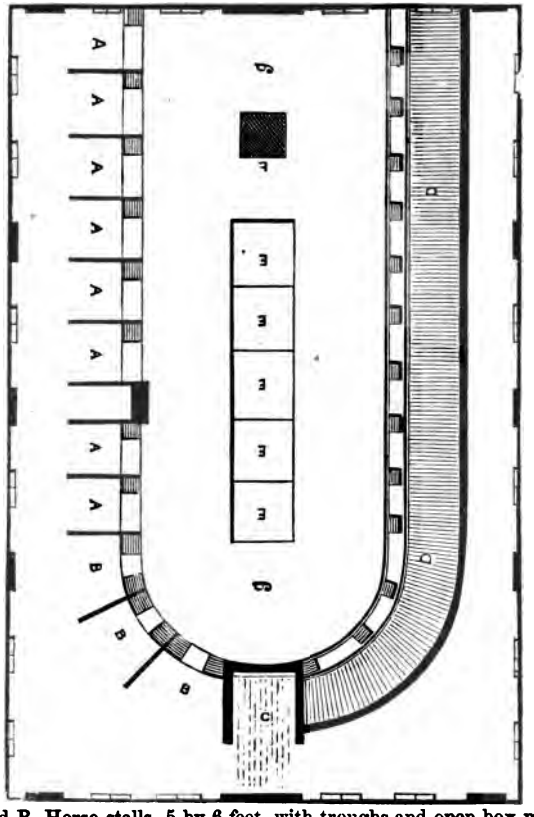
Ventilation is secured by a row of windows in the lower story above the doors and around the entire sides of the building—thence through the scuttles in the second floor—thence through the cupola in the roof. Of course any amount of architectural finish and beauty may be bestowed upon this building, consistent with the means of the farmer, there being nothing in the *form* to prevent.

The plan I have submitted may be easily modified so as to accommodate a mixed stock—horses, oxen, calves, sheep—everything kept on the farm except pigs and poultry; they should have a separate building by themselves. The different kinds could have apartments fitted up for their special accommodation, and all being in compact shape can be easily attended

THE COUNTRY GENTLEMAN.—Were the *Country Gentleman* placed beyond the reach of our agricultural papers, the loss would be felt by thousands who now read with pleasure clippings from its columns. It is beautifully printed and its articles are all prepared with great care and ability. As a journal for the garden, the farm, and the fireside, it has no equal in this country. Its price is but $2.00 per year.—*Boston Register.*

PLAN OF A SMALLER BASEMENT.

The following plan of the basement of a barn 40 by 65 feet, was furnished by B. B., of Pittsburgh. It possesses some peculiar advantages, and has some defects. We would suggest that a part of the *central* portion be used as a *root cellar*, leaving room enough to pass around in front of the animals. Its central position would tend to protect the roots from freezing, and they might be easily filled in by dumping through a trap door above, or through a shute in the side walls.



A and B. Horse-stalls, 5 by 6 feet, with troughs and open box mangers —floors slightly inclined and paved.
B. Open stalls for transient horses.—C. Large entrance to feeding floor.

D. Cow-stalls, 4 by 4, with floor inclining to the rench—which catches all droppings and the liquid manure.

E. Grain boxes, 5 by 5, to which grain is conducted by cloth spout from the threshing floor above.

F. Steam tank—wooden, with a tight lid, fed with steam through a pipe from a boiler without, and with cut feed through a cloth or wooden conductor from the floor above.

G. The feeding floor—elevated about 14 inches above the stable floor, tightly planked, and supplied with hay, &c., from the mows above.

The doors and windows are numerous, for abundant light and ventilation; and the windows should be closed with glazed sash in the winter season. The horse-stalls should be boarded only a part of the way up, and each upright supplied with stout pins for harness, &c. The cattle fastenings should be the upright stakes and clasps.

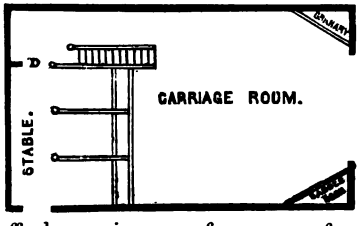
CARRIAGE HOUSE AND STABLE.

We furnish our readers with a plan and description of a carriage house and stable, of moderate size, and capable of holding three horses and three or four vehicles. Buildings of this sort are usually needed much nearer the dwelling than it is convenient or desirable to place large barns and farm establishments; and for this reason they should have a better finish and a greater neatness of appearance than extended farmeries.

The design consists substantially of a main building, about 22 feet wide by 25 feet long, constituting the carriage house and hay loft above, to which a wing is added at one end for the stables. By placing them in a wing a less heavy frame is required, and the gases from the stalls do not rise and impregnate the hay, as would be the case if it were immediately over them. Stable sills are also liable to decay from the liquid manure,

and they are more easily replaced under a wing than if the main building rests upon them.

The wing is 14 by 22 feet, affording a space of 14 feet in length for the stalls, including 2¼ feet for mangers, and each 5½ feet in width. This width is none too great for the comfort of the horses in lying down, or of the attendant in grooming them.



The carriage room, 22 by 25 feet, admits ample space for two carriages or buggies side by side, with room on one side for placing a cutter in summer, and on the other for passing into the stable. These being run in backward, also afford room in cases of emergency for one or two more vehicles with the thills passing under the former.

In one of the front corners is the granary for containing horse-feed, and in the other is a small room for hanging up saddles, buffalo skins, &c., where they will be secure from dust.

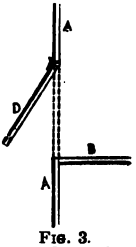


Fig. 3.

The stairs afford ready access to the hay loft, by landing a little beyond the line; the upper part of the wing being several feet higher than the floor of the loft; and as they ascend from the stable passage and not from the carriage room, it is much easier to keep the carriages clean from dust and hay seed, which so commonly find their way down the stair passage, than when they are in the same room where the vehicles are kept. Under the stairs is a small harness room. The stairs being two feet wide leave a passage from the carriage room to the stable of three feet, through which horses may freely pass from one room to the other, or they may be led through the door at the side, as convenience dictates. A door is placed at the first stall near the foot of the stairs, to separate the stable from the other apartments. The arched window over the outer doors, for pitching in hay, is closed by sliding shutters.

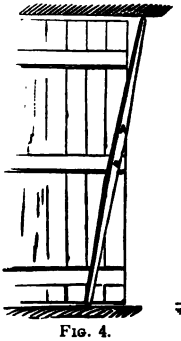


Fig. 4.

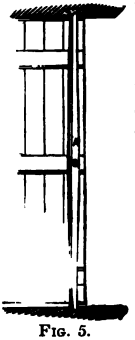


Fig. 5.

The mangers are easily and directly filled from the hay loft through a space, a section of which is represented in the annexed cut, (Fig. 3,) where A A is the partition between the hay loft and the upper part of the stables; B the hay floor; and the door, D, is hung on hinges at its upper side,—so that all that is required is to press a fork full of hay against this door, which crowds it open, and the hay drops immediately into the manger or rack below; the door then closes by its own weight, and shuts off the vapors from the stable.

A ventilator is represented in the perspective view, which allows the impure air from the stalls to ascend and escape. From these

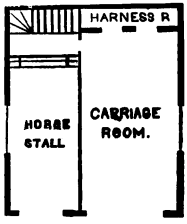
to the peak of the main building, a board tube rises for this purpose, outside and against the main building, and on the upper end of this tube a part of the ventilating turret rests. The other part of it affords ventilation to the hay loft.

This plan may be reduced or enlarged to any desired size, from one stall upwards. An additional stall may be afforded in the smaller plans, without increasing the size, by replacing the stairs with a fixed perpendicular ladder at the end of the mangers, and converting the passage into a stall, which may have a corner manger where the stairs now are.

A door that is opened many hundred times in a year, should have a quick and easy mode of fastening. We have never found any thing better than the contrivance represented in Figs. 4 and 5, which show a portion of the inner side of one of the large doors. A light and stiff bar, A, is attached to the middle batten of the door, so as to turn freely on an iron bolt at the middle. The ends of this bar slide into a groove in the beam and sill, which secure both ends and hold the door fast. A single touch of the hand, throwing it out of the grooves, as in Fig. 4, allows the door to open; and it is again closed and fastened with equal ease, as shown in Fig. 5. This door being fastened, the other latches to it.

SMALL CARRIAGE HOUSE AND STABLE.

The accompanying design is for a carriage house and stable of the smallest size, or for a single horse and buggy. This is all the accommodation that many village and suburban residents need; and such an erection near the dwelling of the large farmer whose business leads him much from home, on short errands, is a great convenience, allowing the other stable and carriage accommodations to be placed at a greater distance from the house, or in connection with the rest of the farm buildings.

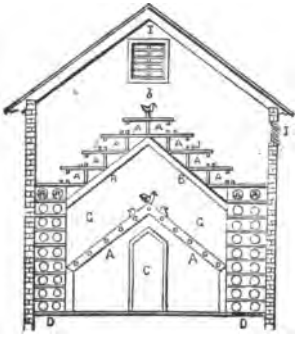


In this plan, which is 16 by 18 feet, there is a single horse-stall, 6 feet wide and 14 long; a carriage room 10 feet wide and 16 long; with a harness room 2 feet wide, at the end. The stairs ascend from a separate apartment, so that dust and hay seed may not reach the carriage and harness; and

under the stairs is a small granary for holding oats. The hay loft is large enough to contain at least one ton of hay, and the window through which the hay is pitched, is closed by sliding shutters. If desired, a light sliding door may be placed in the partition between the stable and carriage room, for passing in stormy weather.

DESIGN FOR A POULTRY HOUSE.

A correspondent furnishes us the annexed design for a poultry house. He says:—I built one last summer, of brick, on a hill-side, with an eastern aspect, having an underground room, which is cool in summer, and warm in winter, and which, my fowls having tested and highly approved, I now recommend as "*just the thing*." I have seen more expensive and curious arrangements, but they proved to be inconvenient or were wholly rejected by the fowls. By constructing the nests in this manner, they may be easily reached, and setting hens and young chicks cared for as they should be to ensure success. I have a dove cote in the roof, which is also convenient and "*approved*" by the pigeons.



INTERIOR OR SECTION OF HEN HOUSE—TWELVE FEET SQUARE.

A A. Joists placed rafter-wise, 3 by 4 inches, in which are holes for the poles for perches, which in this section are seen endwise.

B B. Similar joists, which support the nests *a a a a*, &c.—the series of these also being seen endwise.

b. Perch for the young chicks.

The space between the nests, A A, and the roosts, B B, is three and a half feet.

The space between the nests and the roof is six feet.

C. Door for entering beneath the roosts, for clearing out guano, &c.*

D D. Places of doors, opening next the stairs on each side. These stairs serve to ascend to the nests above, and also contain themselves two boxes for nests between each step, making 36 nests in the stairs, the openings to

* This door, or its equivalent, should be of glass, as the feeding department of a hen house needs an abundant supply of light.—[Eds.

which are represented as round holes in the engraving. These, with the upper nests, make 132 in all, each 1 foot square. There are 12 perches, each 12 feet long, accommodating easily 144 fowls, allowing each 1 foot. Perches may also be made under the stairs, sufficient for 200 fowls in all.

I I. Ventilators, which should be in the south and east sides. These will admit light enough for the laying and setting departments. J. H. D., *Troy, N. Y.*

SCHOOL HOUSES.

We once heard a distinguished traveling lecturer on education, assert that he could at once know a district school house from any other building, by its being the ***worst-looking*** house in the neighborhood. Broken windows and broken walls, and a general air of desolation, have in many cases been the leading features. If children are to be taught the knowledge of order and comfort, these are miserable examples to set before them. In strong contrast with such pictures is one described by DOWNING, a building erected for a ***free school***, by a private gentleman, in Dutchess county, as an example for a district school. "It was a building simple enough after all. A projecting roof, with slightly ornamented brackets, a pretty porch, neat chimney tops; its color a soft, neutral tint; these were its leading features. But a single glance at it, told in a moment that ***the evil spirit had been cast out***, and the good spirit had taken its place. The utmost neatness and cleanliness appeared in every part. Beautiful vines

and creepers climbed upon the walls and hung in festoons over the windows. Groups of trees and flowering shrubs were thriving within its enclosure. A bit of neat lawn surrounded the building, and was evidently an object of care and respect with the pupils themselves." Such an exanple before children could hardly fail to exert a controling influence, to continue through after life.

But it is not the manner of keeping, only, but the structure in erection, that demands a great improvement. Thousands of dollars—we might almost say millions—are yearly wasted in the erection of unsuitable school houses, which most commonly answer the purpose but very imperfectly, and are not unfrequently a great waste of money by bad arrangement. State governments could not better apply a little money than by publishing a small, well prepared pamphlet on the erection, arrangement, and furnishing of the cheaper district school houses, and sending a copy to every district.

The internal structure of a small house is exhibited in the accompanying plan. The teacher's desk, *a*, is on a raised platform; the pupils' desks are in front of this, and occupy the centre of the room. The principal aisle runs thro' the middle, separating boys and girls. This should be four feet wide; the two smaller on either side need not be more than twenty inches wide. Each pupil is provided with a seat and desk, two pupils occupying, side by side, the same double seat—a greater number should never be placed together, for several reasons, one of which is, the inner ones cannot leave their seats without disturbing their neighbors. The smaller or narrower seats and desks, for the smaller children, are placed nearest the teacher; these seats are about nine inches in width, and ten and a half high, with desks twelve inches wide, and twenty-one high. The larger seats are eleven and a half inches wide, and fourteen inches high, with desks fifteen inches wide and twenty-seven high. Every desk should be *numbered*. The stove is placed at S. R R are the recitation rooms, one of which may be used for the smaller children and the other for more advanced classes. If the teacher has one or more assistants, these rooms may be separately partitioned off, or the partitions may be left open next the teacher's desk, but shut off from the rest of the school, or with sliding doors, so that he may hear one of the classes from his seat. Or if only one teacher is employed, there need be no partitions, and the same places occupied by the reciting classes; or, one of these

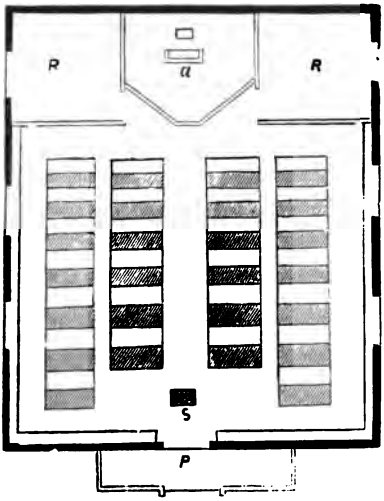


FIG. 1.—Plan of Floor.

rooms may be used for a library, &c. Each room should be furnished with blackboards, and now that clocks are so cheap, no school should be without one, to be placed over the teacher's desk. Outline maps may be hung on the partitions of the recitation rooms. The entrance-porch, P, may be used for hanging up caps, &c., and it should, if practicable, be large enough to contain wood.

If a good well of water and pump could be added, it would be a great improvement. In some places conveniences for washing will be important.

The windows are placed on the two opposite sides—this arrangement lights a school room to the best advantage, and prevents that confusion of light where windows are on three sides.

For children who are compelled to sit several hours during a day, (which is sufficiently irksome and unnatural, to say the best,) easy and comfortable seats should be provided. Sitting long is harder for children than for adults; but few of the latter would be willing to sit so long, even for one day, to say nothing of repeating it for months.

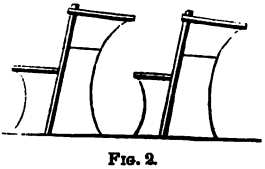


FIG. 2.

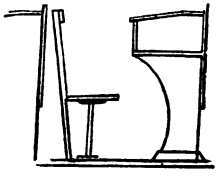


FIG. 3.

Fig. 2 represents the simplest mode of making seats and desks, yet has an important improvement, by giving a *slope* to the back of the seats.

Fig. 3 represents a more finished desk, which may be adopted for larger pupils—the seats and desks being separate, there is less interference with those sitting behind. Each desk has two chairs, consisting of round plank fastened to a cast iron support, strongly screwed to the floor. The backs are made of three slats, screwed to the seat and fastened into a cross top piece. We have already given the dimensions of these. They are becoming commonly used. The desk lids should always open above, as none can be kept neat without.

A seat runs round the room on three sides next the walls, not commonly, but sometimes needed. The other seats connected with the desks are sufficient, in the plan, for 52 pupils, and may be increased or diminished without altering the general arrangement. A house 24 by 28 feet will contain the accommodations here represented, and if built one story high, with *arched ceiling*, with vertical boarding and battens, need not cost more than three or four hundred dollars. It should have something of a tasteful exterior, for to children, lessons in neatness, taste, &c., are quite as important, even in an economical and practical point of view, as chemistry and algebra.

Fig. 4 represents the mode of building we have recommended, presenting a handsome exterior, and a tasteful architecture, of the simplest Italian cast.

Fig. 4.

A simple, cheap, and handsome erection, with the Gothic characteristics, is shown in Fig. 5.

Fig. 5.

For a house built of brick, and of a more costly character, the engraving at the head of this article, (page 192,) represents a handsome specimen, the wings serving for recitation rooms.

A wooden building, where several hundred dollars may be expended, may be given a tasteful and picturesque appearance if built in the Swiss style, as in Fig. 7, copied from the *Horticulturist*

Fig. 7.

The accompanying plan (Fig. 8,) may be adopted or not, as may suit the owners. An entrance-hall or lobby opens into a large school room for boys upon one side, and one for girls upon the other. Between these is a recitation room for both together, which may also contain maps, the book-case for the school library, &c.

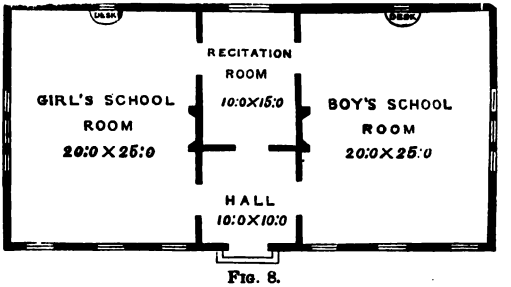


Fig. 8.

In all school houses, especial care is needed to provide ample ventilation, so that none may be subjected to cold currents of air while others are overheated, nor any suffer from the common practice of fifty or more breathing over and over again, all the day long, the same impure body of air.

The great leading and most essential requisite in a school room, we have not mentioned. This is, *to place the seats fronting towards the*

north, so that the outline maps may be suspended on the north side of the room,—and that first impressions of north and south may be correct. Unless a child sees a map for the first time placed in the right position, every thing will be turned round through all the rest of his life. The writer of this article would be willing to give two hundred dollars to-day, if he could have had his first impressions correct in this particular

SHORT DESCRIPTIONS OF THE BEST FRUITS.

It is impossible to make a select list of fruits that shall please every one, for these reasons, viz.: 1, Tastes differ; 2, Fruits vary exceedingly by the diverse treatment they receive; 3, They vary much in different places and seasons; 4, The newer excellent sorts have not been enough tried, and their quality and general adaptation are imperfectly known.

But there are a few sorts that have received a *very large vote* in their favor, either through the country generally, or in many parts of the country, and these are generally introduced in the list. But there is scarcely *one*, but sometimes or in some places fails, and consequently has its objectors.

In making out this list, the labors of the American Pomological Society, and of the various horticultural societies in the different States, with the experience of many individuals, have been made use of.

SUMMER APPLES—IN THE ORDER OF RIPENING.

EARLY HARVEST. Succeeds well throughout most parts of the northern and western States. Often called Yellow Juneating, Yellow Harvest, &c. Size medium, a little flattish; skin a bright straw color; flavor rather acid; quality fine. Shoots of young trees erect and straight.

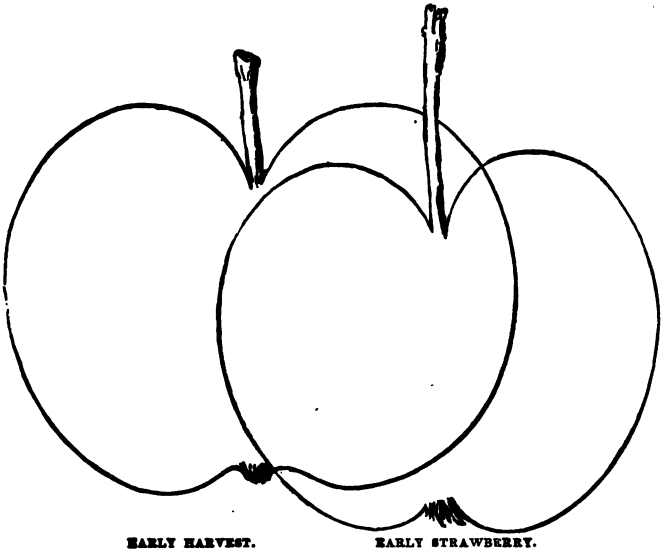
SUMMER ROSE. A rather small, roundish, or slightly flattened apple; skin smooth, and more or less striped with red; flesh fine grained, very tender, with a mild, sub-acid excellent flavor. Continues ripening for a month. Its small size compensated by its great delicacy. Fine throughout the northern and western States. Fruit sometimes scabby.

RED ASTRACHAN. Rather large, roundish and flattened; the whole surface a deep brilliant crimson, with a bloom like a plum; flesh white, somewhat coarse and crisp, rather acid, good. The most showy of all summer apples; excellent for stewing. Shoots strong; leaves broad. Succeeds well in the northern, middle, and western States.

SINE QUA NON. Medium size; roundish, and very slightly conical; skin smooth, greenish yellow, often with a brown cheek; flesh greenish white, very fine grained, exceedingly tender when fully ripe, and of a fine, agreeable, sub-acid flavor. Tree a poor grower in the nursery, hence not widely cultivated, although productive.

EARLY STRAWBERRY. Size rather small, roundish, conical; skin usually a brilliant deep red; flesh white, sub-acid, rather brisk, not very rich. Growth of young shoots very erect, tree productive, and fruit always fair.

PRIMATE. Medium or rather large in size, roundish, conical, ribbed, light green; flesh fine-grained, juicy, mild sub-acid, very agreeable.



EARLY HARVEST. EARLY STRAWBERRY.

Ripens for several weeks through the latter part of summer. It has not yet been proved much out of western New-York.

SOPS OF WINE. Size medium; roundish, slightly oblong; dark red; stem long and slender; flesh white, often stained red, sub-acid, good; flavor not very high, but desirable for its uniformly fair surface and the handsome growth of the tree. Valuable for market. This is not the Sapson, a smaller variety.

AMERICAN SUMMER PEARMAIN. Size medium, roundish oblong; mostly striped or blotched with light red; flesh very tender, sub-acid, of fine quality; late summer and early autumn. Tree of slow growth.

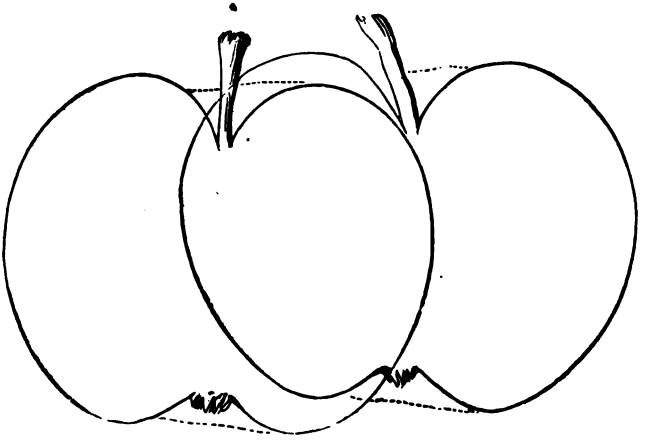
EARLY JOE. Medium size or rather small, flattish; light red; flesh very fine-grained, tender, sub-acid, of an excellent flavor; unsurpassed in quality by any early apple. Tree of slow growth. Not extensively proved yet. Must be eaten fresh.

BENONI. Medium in size; roundish or slightly conical; skin striped with bright red; flesh tender, rich, sub-acid, of fine flavor. The tree is a handsome grower, and good bearer; and the variety valuable. Has proved fine in New England, New-York and some other places.

CAROLINA RED JUNE. A fruit of medium size, rather oblong, and of a beautiful red color, and a sprightly agreeable flavor. Is the most valuable early apple in northern Illinois and the adjacent region. The tree is a fine grower, and bears abundantly.

SUMMER SWEET APPLES.

SWEET BOUGH, or Large Yellow Bough. Large, roundish, sometimes conical; pale greenish yellow; flesh very tender, and of an excellent sweet



SUMMER ROSE EARLY JOE.

flavor. Ripens for several weeks during the latter part of summer. A moderate and regular bearer. Tree round headed. Succeeds well throughout all the northern, middle, and western States.

GOLDEN SWEET. Full medium in size; roundish, and a little flattened; flesh very sweet; good, but not of the highest quality. The fruit is always fair; the tree a free grower, and productive.

AUTUMN APPLES—IN THE ORDER OF RIPENING.

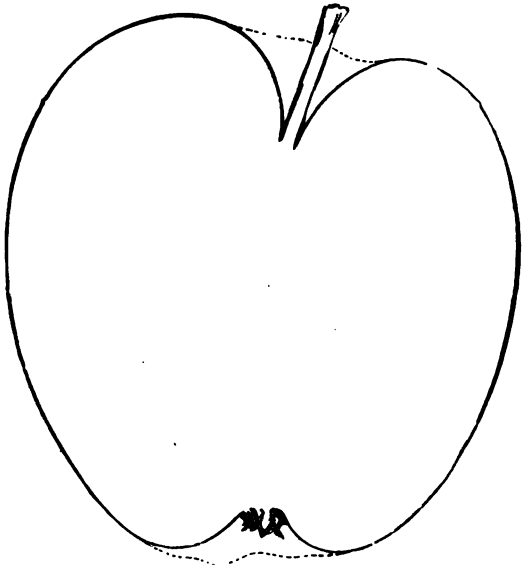
AUTUMN STRAWBERRY, or Late Strawberry. Size medium; roundish, sometimes a little ribbed, the whole surface more or less striped with red; flesh tender, (very slightly fibrous,) juicy, sub-acid, flavor excellent. Tree a handsome grower, and productive. The fruit will keep through autumn.

JEFFRIES. Full medium in size; roundish and flattened; yellow, red, and deep red, striped; flesh yellowish white, remarkably tender and juicy, flavor exceedingly agreeable. From Pennsylvania—not much proved as yet elsewhere; new.

OLDENBURGH, or Duchess of Oldenburgh. Above medium in size; a little flattened; color light red in broad broken stripes; flesh yellowish white, sub-acid; good. Although not of very high flavor, this fruit is valuable for its uniformly smooth and fair skin.

KESWICK CODLIN. Rather large, somewhat oblong or conical; light yellow; juicy, with a pleasant second-rate sub-acid flavor. Very productive, bears when young, and valuable for cooking. Succeeds throughout the northern part of the Union.

LOWELL. Large, roundish oblong, skin a rich yellow, oily; flesh rather coarse, but with a rich rather acid flavor. Valuable for its productiveness, bearing when young, and for its handsome, uniformly fair fruit. Tree a slow, spreading grower. Fine in New-York and Ohio.



PORTER.

HAWLEY. Large, roundish; pale greenish yellow; flesh fine grained, tender, with a mild, sub-acid, rich, agreeable and excellent flavor. Has proved fine in New-York and Pennsylvania. Rather new.

COOPER. Rather large, a little flattish, striped with pale red; flesh very tender, mild and agreeable in flavor, but not rich. A favorite in central Ohio.

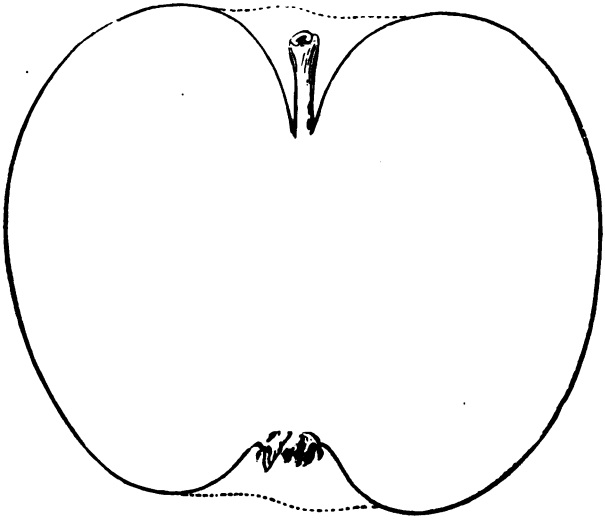
PORTER. Full medium in size; oblong and conical; bright yellow; flesh tender, with a rich, rather acid flavor. Fair, productive, and valuable. Succeeds throughout the northern and western States.

GRAVENSTEIN. Rather large, roundish; striped with bright red; flesh juicy, with a very rich, rather acid flavor. Tree productive, a fine grower, forming a round head; fruit handsome and excellent. This German apple has proved fine in the northen, middle, western, and in some of the southern states.

LELAND SPICE. Rather large, roundish, red; flesh yellowish white, sub-acid, spicy, rich, of fine flavor. A Massachusetts variety; not much proved elsewhere.

FALL ORANGE. Large, roundish oval; pale yellow; flesh sub-acid, and excellent if fresh and ripe from the tree. Tree a strong grower; fruit always fair; tree bears when young. Not widely known.

DYER, or Pomme Royale. Above medium in size; roundish, a little oblong; ribbed toward the blossom end; skin light yellow, with sometimes a russet network; flesh very fine grained, juicy, with a rich, rather



GRAVENSTEIN.

acid flavor, rarely equalled. Tree of slender growth, and a moderate bearer. Ripens through autumn. Fine in New-England and New-York. Bears when young.

SMOKEHOUSE. Rather large, flattish; color a light dull red; flesh rich, aromatic, sub-acid, of fine flavor. Growth, crooked and spreading. Succeeds well in New-York and in the middle and western States.

FAMEUSE. Medium in size; *round*, sometimes flattened; whole surface often a fine deep red; flesh very white, (whence its other name, *Pomme de Neige*, or Snow-apple,) sub-acid, juicy, a little spicy, very pleasant and agreeable, but not very rich.

FALL PIPPIN, called erroneously Holland Pippin, the latter name belonging to a very different apple. Very large; (we have seen it twenty-three ounces;) roundish, sometimes a little conical; skin rich golden yellow when ripe; flesh yellowish, rather firm and hard, becoming tender when fully mature, with a rich, aromatic and excellent flavor. A moderate bearer. Admirable for stewing. Excellent in the northern, middle, western, and several southern States. It becomes a winter apple far north.

RAMBO. Size medium; flattened; color dull light red; with a mild sub-acid excellent flavor. A favorite throughout the western States.

AUTUMN SWEET APPLES.

JERSEY SWEETING. Size medium; roundish ovate, striped with red; flesh very sweet, juicy, and tender; of good quality, but not of the highest character Productive and valuable, and succeeds well through the north and west.

SUMMER SWEET PARADISE. Quite large; roundish; pale green, becoming yellowish; sweet, rich, aromatic, of fine flavor. Has not been widely proved.

AUTUMNAL SWAAR. Large; flattish; color rich yellow; flavor very sweet, spicy and agreeable. An excellent fruit. Not widely known. There is a greatly inferior sort, known in western New-York as "Sweet Swaar."

HASKELL SWEET. Large, often very large; flattish; greenish yellow, flesh often tinged with yellowish brown; tender, sweet, rich, and good. A great bearer; new; has proved fine in Massachusetts and New-York.

WINTER APPLES—IN THE ORDER OF RIPENING

MELON. Full medium in size; roundish, slightly conical; handsomely striped with red; flesh tender, very juicy, fresh and pleasant, spicy, with a mild, sub-acid, exceedingly agreeable flavor. Considered by some as the best of all table apples. Growth quite slow, and a moderate bearer; new. Not much proved out of western New-York. May be eaten in autumn, and will keep till spring.

BULLOCK'S PIPPIN, or American Golden Russet. Rather small; conical; light yellow, thinly and partly covered with light russet; stem long, slender; flesh very fine grained, becoming very tender, with a mild, slightly sub-acid flavor. This apple proves excellent nnd valuable throughout most parts of the western States; but at the north and east it is often quite worthless.

BELMONT. Rather large, often oval, sometimes flattish, variable; color pale yellow, frequently with a light vermillion blush; flesh rather compact, becoming tender, with a mild, rich, sub-acid, excellent flavor. It is particularly excellent and valuable in northern Ohio, and in some parts of the middle States.

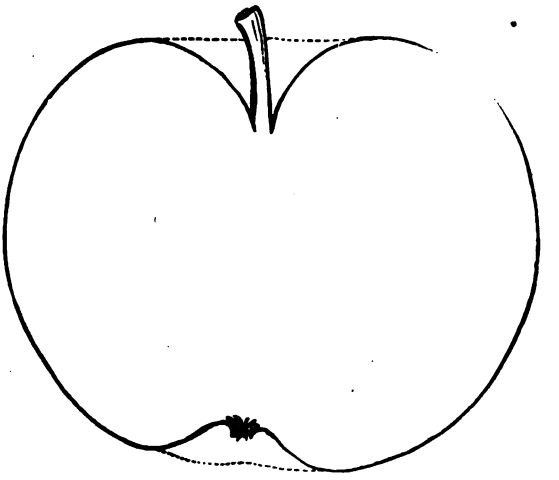
HUBBARDSTON NONESUCH. Rather large, roundish, often a little oblong, and largest at the middle; striped with light rich red; flavor mild sub-acid, excellent. Loses by keeping. Succeeds best in New England.

MCLELLAN. Full medium in size; round, smooth, regular; striped with lively red on yellow ground; flesh fine grained, tender, slightly sub-acid, agreeable, not very rich. The fair fruit and productive tree render the McLellan a valuable apple. Proved only in New-York and New England.

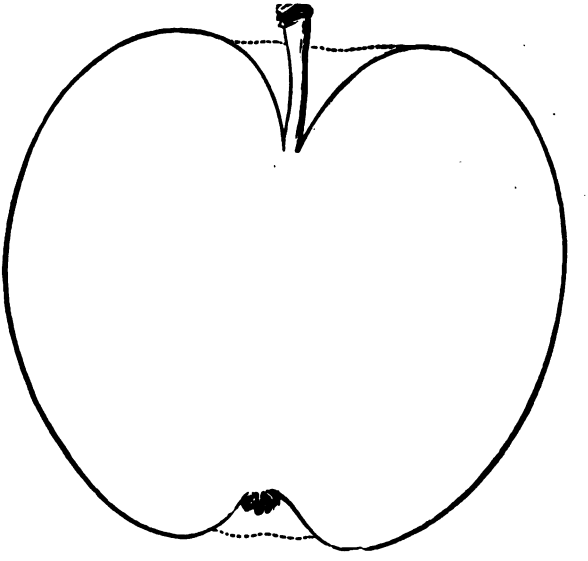
PECK'S PLEASANT. Large, roundish, shape somewhat variable in different seasons; stem very short; color light green becoming yellow; calyx, or eye, large and open; flesh compact, tender, breaking, with a fine, clear, Newtown Pippin flavor. A good bearer; *fruit always fair;* poor if too ripe. Origin, Rhode Island; rather new; fine in western New-York.

WESTFIELD SEEKNOFURTHER. Full medium, roundish, a little conical, very regular; color light, dull red, sometimes much russeted; flesh tender, rich, spicy, and fine. Tree productive, and fruit fair. Fine throughout the northern States.

YELLOW BELLFLOWER. Large when well grown; oblong, somewhat conical towards the apex, more or less irregular; skin pale yellow; flesh fine grained, tender when ripe, juicy, rather acid, becoming milder with ripening; flavor excellent. Succeeds well in most of the northern, middle and western States, but fails in some localities



BALDWIN



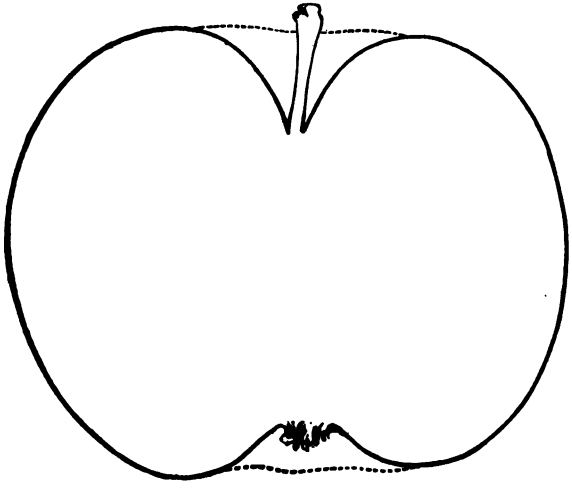
ESOPUS SPITZENBURGH.

BALDWIN. Rather large; roundish; color more or less dull red, becoming light or yellowish red at maturity; flesh yellowish white, rather coarse, flavor rather rich, mild sub-acid. Varies much in flavor with seasons, culture, locality, and age of tree. A great bearer, young and old; fruit fair, and very popular as a market variety. Succeeds well in the eastern States, in most parts of New-York, and frequently in the middle and western States. At the south it becomes a summer apple.

RHODE ISLAND GREENING. Large, somewhat flattish; color greenish yellow; always smooth and fair; flesh yellow—greenish if much shaded, a rich yellow when well exposed—tender, with a rich, rather acid flavor. Well known in New-York and other portions of the north as the most reliable and profitable market sort. Not sufficiently proved yet at the west, but does not promise so well there. An autumn apple at the south.

PRYOR'S RED. Medium or rather large; roundish, irregular; color dull brick-red and russet; flesh tender, mild, agreeable. Succeeds best at the south-west, where it is highly esteemed; not so good in New-York.

ESOPUS SPITZENBURGH. Rather large, round-ovate; color a high rich red; flesh yellow, firm, and compact, crisp, spicy, rather acid, scarcely equalled in richness and high flavor. Admirable for culinary purposes. A moderate bearer. Succeeds best in New-York, but does well in many parts of New England and at the west.



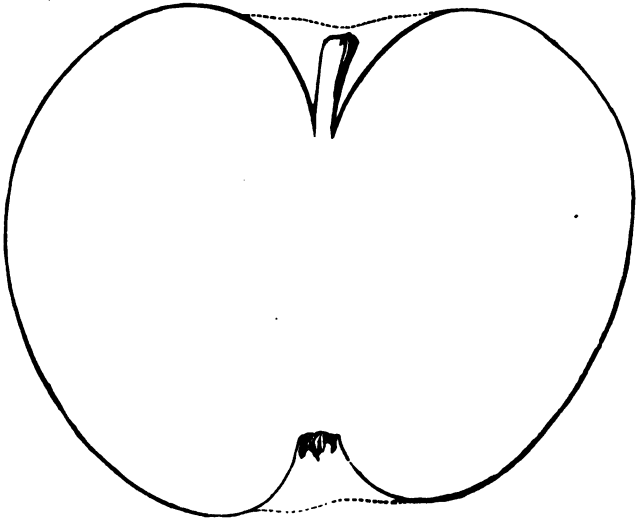
SWAAR.

SWAAR. Above medium in size; roundish, mostly somewhat flattened; color becoming a rich yellow; flesh fine grained, compact, tender, with a very rich, mild, aromatic, agreeable flavor. Esteemed by some as the best winter table apple. Keeps into spring; fruit apt to be scabby on overloaded trees. Succeeds best in New-York Michigan &c. often poor in New England.

RED CANADA, sometimes known as Nonesuch and Old Nonesuch. Size medium; roundish conical; mostly covered with light red, and interspersed with rather indistinct whitish dots; flesh fine grained, compact, with a rich, sub-acid, high and excellent flavor. Growth slender and feeble; fruit not always fair. Succeeds more or less in New England, New-York, and Ohio.

JONATHAN. Rather small at the east, often quite large at the west; roundish-ovate; color a deep bright red; flesh nearly white, spicy, sub-acid, of an excellent flavor. Growth of tree slender, but a great bearer; fruit fair, and some specimens from the west exceedingly beautiful.

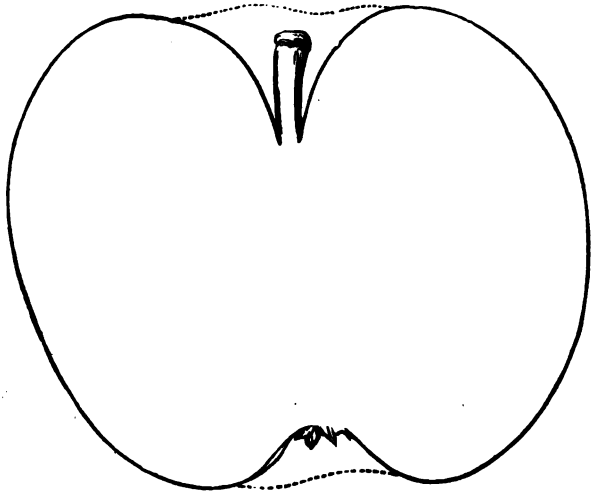
RAWLES' JANNET, or Neverfail. Size medium; roundish; slightly striped with pale red; flesh crisp, nearly white, with a fine texture, and a mild, good flavor. Blossoms later than usual, often escaping spring frosts—and hence the name Neverfail. A valued market fruit in the Ohio valley, keeping through spring.



NORTHERN SPY.

NORTHERN SPY. Large, roundish conical; handsomely striped with red; flesh tender; flavor mild and agreeable, spicy, excellent—which it retains with remarkable freshness late into spring. Tree a vigorous and very upright grower; long in coming into bearing; needs thinning out in pruning; requires rich and high culture.

NEWTOWN PIPPIN. Above medium; roundish, somewhat irregular; dull green, becoming yellowish green; flesh greenish white, juicy, crisp, fine grained, with a high, excellent flavor. Tree of slow growth; bark rough. Often scabby, unless with high culture. Succeeds well in New-York and the western States; poor in New England.



NEWTOWN PIPPIN.

ROXBURY RUSSET. Size medium; commonly flattish; mostly covered with rather rough russet, on a greenish yellow skin; flesh rather granular, crisp, with a good sub-acid flavor. Growth spreading; shoots downy. Uniformly fair and productive. A famous market fruit in the northern States, and succeeds in many places at the west.

ENGLISH RUSSET, or Poughkeepsie Russet. Rather below medium in size; roundish, or roundish-conical; more or less russeted, on a light, greenish yellow skin; flesh greenish or yellowish white, rather firm, with a sub-acid, good flavor. Will often keep twelve months. A profuse bearer. This is distinguished from the Roxbury Russet by the *upright* growth of the young trees and shoots.

WINTER SWEET APPLES—IN THE ORDER OF RIPENING.

BAILEY SWEET. Large; ovate; mostly a full, bright red; flesh very tender, not juicy, with a mild, rich, sweet flavor. New. Not proved much out of western New-York.

WELLS SWEETING. Size medium; roundish; color light green; flesh white, tender, rich, agreeable. From Newburgh, N. Y. Not widely proved.

SWEET BALDWIN. Medium; round; deep red; compact; very sweet. Not widely proved.

TALLMAN SWEETING. Above medium; roundish; a clear, light yellow, *with a distinct brownish line from stem to blossom;* flesh white, *firm,* rich, very sweet. The original mis-spelling—Tolman—should not be copied.

DANVERS SWEET. Above medium; roundish, a little conical; light yellow, often a handsome blush; flesh yellow, sweet, rich. Succeeds well in the eastern and middle States.

BROADWELL. Rather large; a little flattish and conical; greenish yellow; flesh white, tender, sweet, juicy, and of a fine flavor; somewhat resembling the Sweet Bough of summer. A fine new Ohio variety.

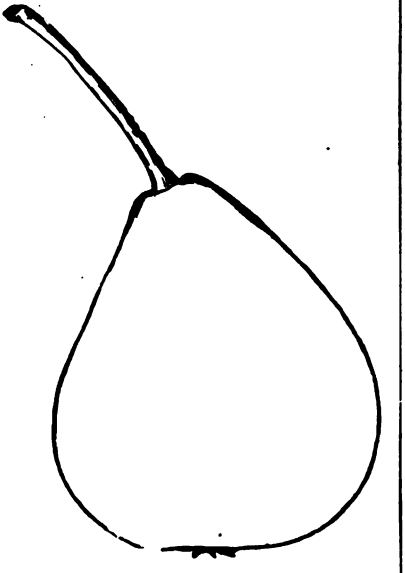
LADIES' SWEETING. Medium, or large; roundish or roundish-ovate; a fine, bright red at maturity; flavor sweet and agreeable, not very rich. Tree of feeble growth, and usually overbears. Origin, Newburgh, N. Y., and proves fine in other localities.

GREEN SWEET. Rather large; round; green, with whitish dots; flesh greenish white, with a very sweet, spicy, good flavor. Productive, always fair, and a long keeper.

PEARS.

SUMMER PEARS—IN THE ORDER OF RIPENING

MADELEINE. Size medium; obovate-pyriform; smooth; greenish yellow; flesh very juicy and melting, with a faint degree of acid astringency, and a very agreeable, refreshing flavor. Like nearly all other summer pears, needs house-ripening. Matures at the north at the time of wheat harvest.—Growth erect and vigorous.



MADELEINE.

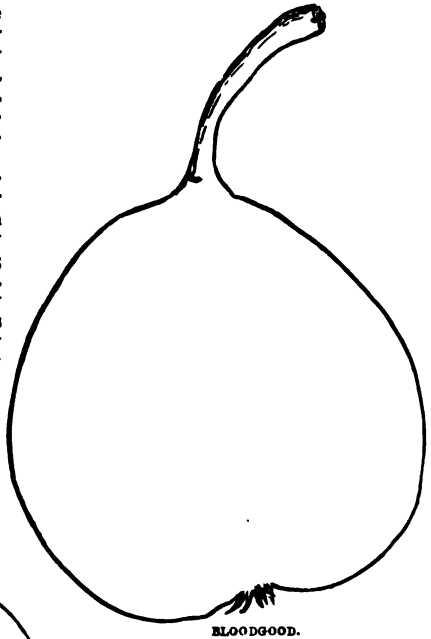
SUMMER DOYENNE, (or *Doyenné d'Eté.*) Rather small; roundish obovate; skin a fine yellow, usually with a bright red cheek; flesh melting and juicy, with a sweet, slightly perfumed flavor. Ripens nearly or quite as early as the Madeleine, and is by some preferred to that variety. Shoots slender; tree bears very young.

SKINLESS. Rather small; pyriform; regular; skin smooth, very thin, yellowish green; flesh half melting, juicy and sweet, slightly perfumed; flavor good. Ripens two weeks after the Madeleine, and valuable for its vigorous, erect growth, its profuse productiveness, and period of ripening.

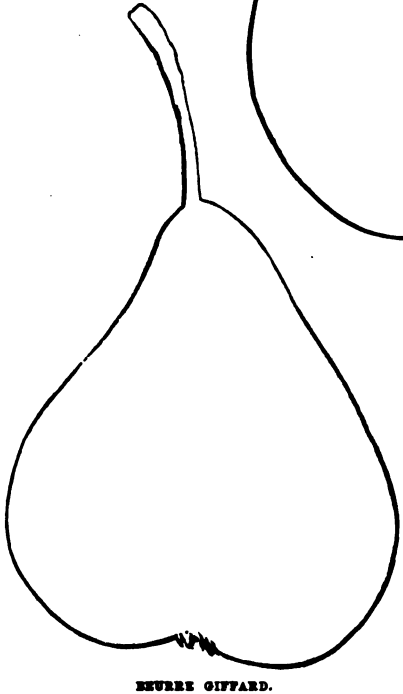
BLOODGOOD. Medium in size; obovate; yellow, more or less touched with russet; flesh yellowish white, buttery, melting, with a fine, rich, aromatic flavor when at its best. Sometimes the flavor is poor and insipid. Tree of moderate growth. Ripens immediately after Skinless.

OSBAND'S SUMMER. Size medium; obovate; regular in form, sometimes slightly pyriform; yellow, with a reddish cheek; flesh with a sweet, fine, perfumed flavor. Tree a vigorous grower.

BEURRE GIFFARD. Medium, sometimes rather large; pyriform; skin greenish yellow, usually with a dotted red cheek; flesh tender, juicy, with a sweet, refreshing, very agreeable flavor. Shoots slender. Although a new sort, it has been widely



BLOODGOOD.

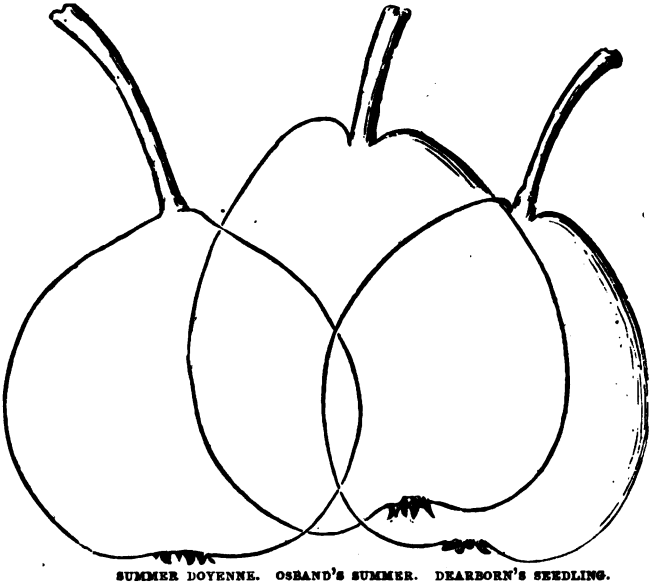


BEURRE GIFFARD.

proved, and is very highly esteemed. Ripens very closely on the last,—indeed the Bloodgood, Osband and Giffard differ very slightly in their periods of maturity.

DEARBORN'S SEEDLING. Rather small; obovate, regular; smooth; skin clear yellow; flesh fine grained, melting, juicy, and of fine flavor. Fruit, although too small to become very popular, always of fine quality. Tree bears quite young. Ripens immediately after the three preceding sorts.

TYSON. Medium in size, often rather large; obovate-pyriform, acute; color a bright yellow, with a rich, softly



SUMMER DOYENNE. OSBAND'S SUMMER. DEARBORN'S SEEDLING.

shaded, red cheek; flesh very fine grained, buttery, very melting, with a nearly sweet, perfumed and excellent flavor. Ripens in western New-York during the last two weeks of summer. Growth erect, vigorous. Tree late in coming into bearing, but grows finely on quince, and bears soon.

ROSTIEZER. Rather small; obovate-pyriform; skin dull brownish green, with a dark, brownish red cheek; flesh juicy, melting, sweet, with a very high, perfumed flavor. This is perhaps the highest flavored of all summer pears, and stands about the same in rank with summer varieties as the Seckel does with those of autumn.

There are several new summer pears of high reputation, among which may be named the Ott, Hosenshenk, Brandywine, and Moyamensing,—Pennsylvanian varieties, which have not as yet been much proved out of that State, and consequently their fitness for general cultivation not fully determined.

AUTUMN PEARS—NEARLY IN THE ORDER OF RIPENING.

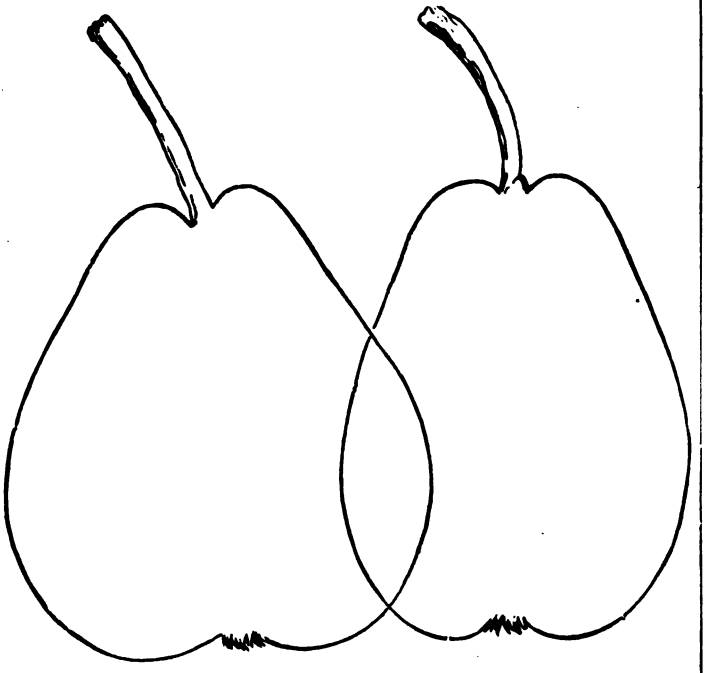
[Good autumn pears are much more numerous than those of summer or winter. The following list comprises most of those which have proved valuable, but there are still a considerable number of older varieties of merit, or of new sorts of promise, that our want of space has excluded.]

BARTLETT, (or *Williams' Bonchretien.*) Large; obtuse-pyriform; surface wavy; clear yellow; flesh fine grained, very tender and buttery, sweet, sometimes faintly sub-acid, perfumed, moderately rich flavor. Tree erect

and thrifty; bears very young. Ripens if picked two weeks before maturity, even if not full grown. Ripens about the first of autumn at the north, in summer further south. Universally popular. This and the Seckel were the only pears that received a *unanimous* vote in the committee of nine, appointed by the first Congress of Fruit Growers in New-York in 1848.

ANDREWS. Medium size; pyriform; skin thick, greenish, with a brown cheek; flesh very juicy, melting, with a fine, agreeable flavor. Very productive, and bears young. From Massachusetts.

KIRTLAND. Medium or small; round-ovate; greenish, with rich brown russet; flesh fine grained, buttery and melting, perfumed, with a high, excellent flavor like the Seckel. From Ohio.



GOLDEN BEURRE OF BILBOA. WASHINGTON.

BILBOA, (or *Golden Buerré of Bilboa.*) Full medium; obovate or slightly pyriform, regular; skin smooth, fair, yellow, russeted round the stalk; flesh fine grained, buttery, moderately rich.

ST. ANDRE. Medium; obovate; greenish yellow, with some red dots; flesh fine grained, buttery, melting, excellent.

PRATT. Medium, or rather large; obovate-pyriform; greenish yellow, with numerous dots; flesh tender, melting, juicy, excellent. From Rhode Island.

WASHINGTON. Size medium; oblong-obovate, sometimes obtuse-pyriform; smooth; clear yellow, with handsome red dots on the sunny side; flesh juicy and melting, but not buttery, with a rich, very sweet, perfumed, excellent flavor. Growth erect.

GENESEE, (or *Stevens' Genesee.*) Large; round obovate; skin slightly rough, yellow; flesh a little coarse, half-buttery, with a rich, good, but not first-rate flavor.

HEATHCOT. Medium; obovate; regular; greenish yellow, with some russet flesh buttery, rich, perfumed, excellent when at its best. Growth upright; productive. From Massachusetts.

SECKEL. Small; obovate; brownish green, becoming rich yellowish brown; flesh very fine grained, sweet, very juicy, melting, buttery, highly perfumed; the richest and highest flavored pear known. Growth slow and stout; tree small; very productive. The size of the fruit is much increased by high culture. Popular everywhere.

BUFFUM. Medium; obovate; yellow, with a broad, reddish brown cheek, somewhat russeted; flesh buttery, sweet, of fine flavor, but not best. Growth erect, strong; tree healthy and very productive.

FONTENAY JALOUSIE, (or *Jalousie de Fontenay Vendee.*) Full medium; obovate-pyramidal; pale, dull yellowish green, somewhat russeted; flesh melting and buttery, mild, rich, fine flavored.

BELLE LUCRATIVE, (or *Fondante d'Automne.*) Full medium, sometimes large; obovate, sometimes slightly pyriform; pale yellowish green, often slightly russeted; flesh, with a very fine texture, juicy and melting, and, when well grown and ripened, of an exceedingly delicate, rich, perfumed and excellent flavor; sometimes it is quite poor.

FLEMISH BEAUTY. Large; obovate, obtuse; skin slightly rough, with more or less reddish brown russet; flesh very melting and juicy, and mostly sweet, rich, and excellent. Growth strong and healthy, tree productive, and fruit always fair. Must be picked before full maturity.

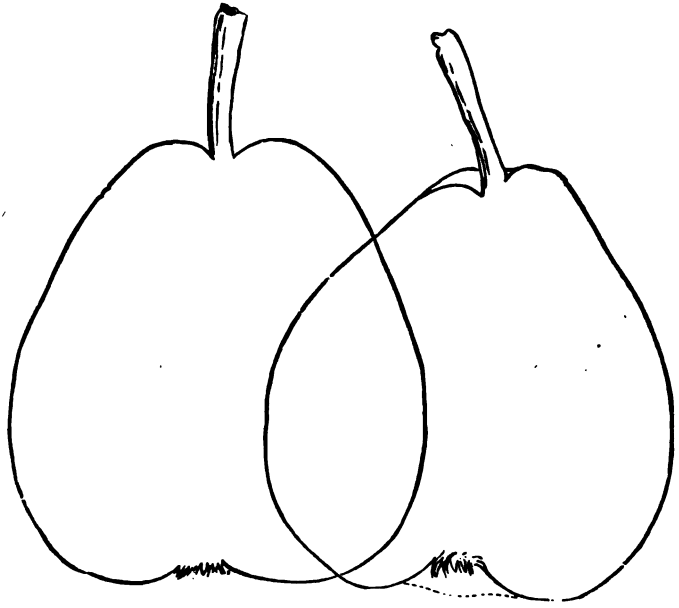
HOWELL. Full medium, or rather large; short pyriform; surface pale yellow; flesh melting and buttery, of a fine but not very high flavor. Bears very young; always productive; fair and uniform in size. A graft on an old tree on the grounds of Ellwanger & Barry, of Rochester, bore three pecks the third summer.

VAN ASSCHE, (or *Van Assene.*) Rather large; obtuse obovate; skin fair, smooth, dull yellow; flesh white, slightly coarse, buttery, melting and rich. New. Belgian. Productive and valuable.

DUCHESSE D'ORLEANS, (or *Beurré St. Nicholas.*) Usually large; long pyriform; greenish yellow, sometimes bright red to the sun, more or less thinly russeted; flesh melting, buttery, rich; when well ripened, delicious. New, and promises to be valuable.

LOUISE BONNE OF JERSEY. Large; pyriform, somewhat oblong; smooth; yellowish green, with a brownish red cheek; flesh juicy, buttery and melting, of a rich, fine flavor, hardly first-rate, sometimes astringent. Very productive. One of the most valuable market pears. Succeeds best and grows with great vigor on the quince.

URBANISTE. Rather large; obovate-pyriform, obtuse; pale yellow; flesh melting, very buttery, with a fine, delicious, perfumed flavor when best, and sometimes a shade of acid, with second-rate flavor. Moderate bearer.



WHITE DOYENNE. GRAY DOYENNE.

BEURRE BOSC. Large; distinct pyriform; nearly smooth; deep yellow with russet patches; flesh juicy, buttery, rich, excellent. A regular, even bearer.

AUTUMN PARADISE, (or *Paradise d'Automne.*) Rather large; pyriform; surface uneven; yellowish orange, with some russet; flesh melting, very buttery, with a rich, high, excellent flavor. It resembles the last, but is more irregular in form, and is more melting and sprightly.

ONONDAGA, (or *Swan's Orange.*) Quite large; oval pyriform, short and obtuse; skin becoming a rich yellow, a little rough; flesh slightly coarse, moderately buttery and melting; flavor good, but not first-rate, often too acid and astringent. Very valuable for its strong growth, early bearing, and its large, uniformly fair fruit.

BEURRE D'ANJOU. Rather large; obtuse obovate, regular; greenish yellow, often clouded with russet; flesh fine grained, buttery, melting, with a high, rich, vinous, excellent flavor. A fine even bearer of uniformly perfect fruit. Very valuable.

DIX. Large; long pyriform; deep yellow when ripe, with numerous dots; flesh rather granular, rich, juicy, sweet, excellent, sometimes rather acid. A tardy bearer; shoots often thorny.

DUCHESS OF ANGOULEME. Very large; very obtuse pyriform; surface quite uneven; greenish yellow; flesh rather coarse, melting, buttery, juicy,

flavor often very fine, sometimes poor. Grows with the greatest vigor, and always best on quince stocks. Extra large and well ripened specimens have sold in market for fifty cents to one dollar each.

VIRGALIEU, (or *White Doyenné, St. Michael* of Mass., *Butterpear* of Pa.) Full medium; regular obovate; yellow, often with a faint blush; flesh very fine texture, melting, buttery, with a sweet, rich, excellent flavor. Possesses a higher reputation as a market pear, in western New-York and some other places, than any other sort; many trees yielding annually from twenty to thirty dollars worth of fruit.

GRAY DOYENNE. Nearly resembles the last, but perceptibly smaller and less blunt at the stem, and the whole surface covered with a rich cinnamon russet; flavor more perfumed and excellent.

DOYENNE BOUSSOCK. Resembles the Virgalieu, but larger, and not equal to it in quality.

FULTON. Rather small; roundish; whole surface smooth gray russet, becoming dark cinnamon; flesh half-melting, buttery, rich, sprightly, agreeable. Valuable. Tree very hardy and productive.

SHELDON. Large; roundish-obovate, very obtuse; nearly whole surface covered with dark russet on a greenish yellow skin; flesh juicy, rich, and excellent. From Wayne Co., N. Y.

OSWEGO BEURRE. Medium; obtuse obovate; regular; yellowish green, with some thin russet; flesh melting, juicy, and with a nearly sweet flavor. Tree vigorous, hardy, and productive.

BEURRE CLAIRGEAU. Large; pyriform; brownish green, russeted, sometimes red to the sun; flesh juicy and melting, with an agreeable subacid flavor. Growth strong; bears early. A new variety of high promise.

BEURRE DIEL. Large; short pyriform, sometimes nearly obovate; dull yellow, with many dots and some russet; flesh rather coarse, rich, sugary, buttery, juicy, fine. Best on quince stocks.

NAPOLEON. Above medium; pyriform-obovate; skin green, becoming yellowish; flesh uncommonly juicy, melting, moderately rich, very refreshing, sometimes astringent. Needs ripening in a warm room. Very productive, thrifty, hardy.

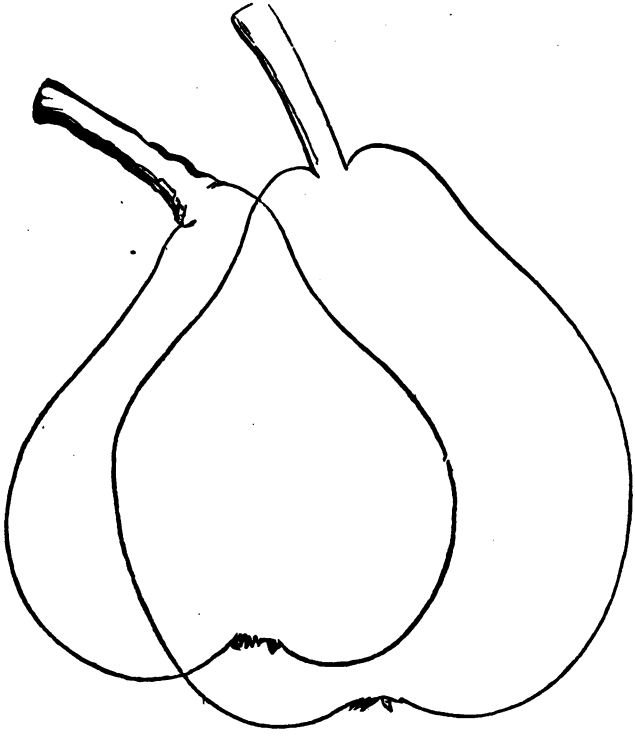
BERGAMOTTE CADETTE. Medium; round-obovate; greenish yellow, often slightly reddened and russeted; flesh melting and buttery, juicy, sweet, quite rich, slightly perfumed. Productive.

WINTER PEARS.

[The good quality of winter pears depends greatly on their ripening. If in too damp a cellar, they will rot; if in one too dry, they wither and never become mellow. As a general rule, winter pears should be kept in a cool apartment or cellar till near the usual time of maturity, when they should be brought into a warm room. In a few days they will be found to assume the golden yellow skin and the melting flesh which distinguish ripeness in our finest autumn pears. The warm temperature should be *uniform*, and the light excluded; for which reasons drawers are found best. Sorts which quickly ripen and become melting, must be kept cooler than those of a harder nature, or they will too soon decay.

It often happens that winter pears do not ripen well because they have not been well grown, and because they have not been fully developed by *rich cultivation*.]

VICAR OF WINKFIELD, (or *Le Curé.*) Quite large, long pyriform; smooth, pale yellow, often with a dull reddish cheek; flesh juicy, buttery, with a good, second rate flavor—sometimes a little astringent. Growth irregular or straggling—leaves nearly round. Ripens late autumn and early winter, for about three months, which, with its productiveness, fine qualities for cooking, and uniformly fair fruit, makes it very valuable.



BEURRE D'AREMBERG. GLOUT MORCEAU.

AREMBERG, (or *Beurré d'Aremberg.*) Medium or large, short pyriform, stalk thick and fleshy; skin thick, greenish yellow, partly russeted; flesh yellowish, melting and juicy, with a high, vinous, rather acid flavor. A great bearer—and keeps with little care. Late autumn and early winter.

GLOUT MORCEAU. Large, short obtuse pyriform; greenish; flesh white, fine grained, buttery and melting, sweet, of fine flavor. Early winter. Best on quince.

LAWRENCE. Medium, obovate, slightly pyriform; skin yellow, flesh melting, sweet, rich, high flavored. A good grower, fine bearer, and very valuable pear for market. Early winter.

BEURRE LANGELIER. Large, pyriform, obtuse; pale-yellow with a slight blush—flesh fine grained, melting and juicy—flavor rich and fine. First half of winter.

WINTER NELIS. Medium, roundish obovate, sometimes slightly pyriform; yellowish green, much russeted—flesh fine grained, buttery and very melting, rich, sweet or slightly vinous, perfumed and of excellent flavor. Growth slender and very straggling, productive, and probably the higest flavored of all winter pears.

PASSE COLMAR. Medium or rather large, short pyriform, pale yellow; flesh fine grained, buttery, melting, and sweet,—when well grown, and well ripened, of a delicious flavor. Overbears. Early winter.

DOYENNE D'HIVER. Large, pyriform, yellow, with a tinge of brown to the sun; flesh melting, buttery, rich. Growth upright and vigorous. Keeps mostly through winter.

PRINCE'S ST. GERMAIN. Medium, obovate, sometimes slightly pyriform obtuse; partly russeted on a green skin and dull red to the sun; flesh juicy and melting, slightly vinous, with an agreeable and fine flavor. Ripens through winter. A good variety.

EASTER BEURRE. Large, obtuse obovate; yellowish green, often a broad, brown cheek; flesh, when well grown and ripened, very buttery, juicy, of an excellent, first-rate flavor. Best on quince. Needs high warm culture at the north. The best late pear, ripening in spring.

A good selection of summer, autumn, and winter pears, will furnish a succession of this delicious fruit from midsummer till late in spring—instead of a supply for a week or two, as too often happens, from a few trees of common sorts.

PEACHES.

FREE STONES OR MELTERS—IN THE ORDER OF RIPENING.

[Varieties are distinguished in part by their leaves and flowers. The cut leaved sorts, (always without glands) are shown by Fig. 1, the small globose glands, by fig. 2; and the large, or reniform glands, by fig. 3. The large flowers are represented by fig. 4, and the small, by fig. 5.]

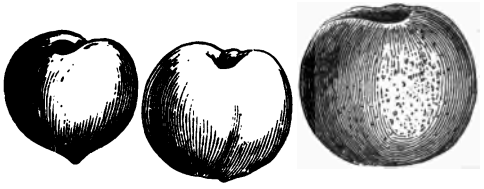
FIG. 1. FIG. 2. FIG. 3.

EARLY ANNE. Small, round, greenish white—flesh white to the stone—a mild, pleasant, vinous flavor. Cut-leaved, and large flowered. Tender and of slow growth—but valuable for its earliness.

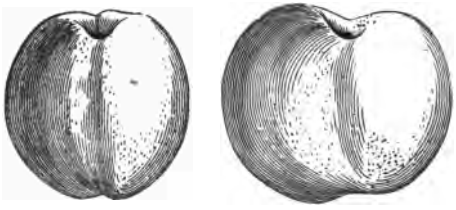
EARLY TILLOTSON. Medium, round, mostly dark red; flesh partly adhering to the stone, juicy and high flavored. Flowers small, leaves cut, and

COMPARATIVE FORMS OF PEACHES,

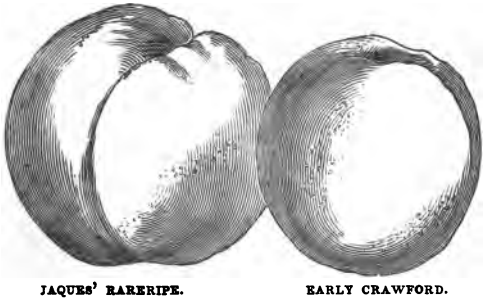
ACCURATELY REDUCED TO A SCALE OF ONE-HALF THE DIAMETER.



NUTMEG. EARLY ANNE. EARLY TILLOTSON.



SERRATE EARLY YORK. LARGE EARLY YORK.



JAQUES' RARERIPE. EARLY CRAWFORD.

apt to mildew—often fails at the north, but unexcelled in Virginia, Kentucky, and other more Southern States. Varies sometimes 2 or 3 weeks in ripening on the same tree. A great bearer.

Fig. 4.

Fig. 5.

Serrate Early York. Medium, roundish oval, mostly dark red—flesh uncommonly juicy—rich, with a faint mingling of acid. Stone red. Leaves cut, and flowers large.

The three preceding usually ripen in New-York from two to four weeks before the close of the summer months.

Cole's Early Red. Medium, roundish, with a fine red cheek; flesh moderately juicy, pleasant, good, but not of first quality. Leaves with globose glands, growth vigorous, tree productive.

Early Newington Freestone. Medium, roundish, white, dotted and streaked with red, and with a rich red cheek; flesh at first adhering, afterwards partly separating from the stone—juicy, rich, fine.

Cooledge's Favorite. Full medium, roundish, skin nearly white in the shade, with a broad very brilliant red cheek to the sun; one of the most showy of all peaches; flesh very juicy and melting, with a rich, faintly acid flavor. Very productive, hardy, and valuable. Glands globose, flowers small.

Grosse Mignonne. Rather large, roundish, with a deep red cheek, with a juicy, rich, and high flavor. Flowers large, glands globose.

Large Early York. Large, roundish, sides full, nearly white in the shade, full deep red in the sun—flesh very fine grained, very juicy, with a mild, rich, excellent flavor. Flowers small, glands globose. Very productive and valuable.

George the Fourth. Large, round, deep red to the sun, flesh juicy, rich, excellent. Much resembles the last, but ripens a little later, more moderate bearer, higher flavored, and branches rather more spreading.

White Imperial. Rather large, roundish, nearly white, a little tinged with purple to the sun; very juicy, with a mild, excellent flavor. Fine at the north—often worthless south.

Brevoort. Medium or large, round, deep red to the sun, flesh rather firm, rich, sweet, and high flavored. Glands reniform, flowers small.

Barnard, (or *Yellow Alberge*, erroneously.) Large, deep yellow, with a dark, rich red cheek; flavor fine; shoots rather spreading—tree very hardy and productive. Glands globose, flowers small.

Crawford's Early. Very large, has measured over ten inches round, roundish oval, light yellow, with a broad reddish cheek; flesh yellow, juicy, vinous, fine, but not fully first rate. Productive, hardy, and succeeds everywhere. Glands globose, flowers small.

Bergen's Yellow. Quite large, round, color deep orange, with a broad red cheek; flesh juicy, rich, and excellent. Probably the finest of all yellow peaches. Growth and productiveness, moderate. Glands reniform, flowers small.

Jacques' Rareripe. Very large, roundish, one side larger with a deep suture, yellow shaded with deep red; flesh deep yellow, red at the stone, of good but not highest flavor. Shoots rather spreading. Glands small reniform, flowers small.

NIVETTE. Large, roundish, slightly oval, surface rather even, yellowish green, with a faint red cheek, flesh greenish white, reddish at the stone, juicy, melting, and rich. An excellent peach for the middle season of ripening. Glands globose, flowers small.

MORRIS WHITE. Rather large, roundish oval, skin rather downy, pale creamy white at maturity, flesh wholly white, free from the drab stone, melting, juicy with a good flavor, hardly first rate north, better in the middle states, and popular everywhere. Glands reniform, flowers small.

OLDMIXON FREESTONE. Large, roundish, slightly oval, pale yellowish white, with a marbled red cheek, flesh deep red at the stone, tender, rich, excellent. Fine in all localities. Glands globose, flowers small.

PRESIDENT. Large, roundish, very downy, yellowish white, with a dull red cheek, flesh deep red at the stone, juicy, with a fine flavor, partly adhering to the stone. Glands globose, flowers small.

RED-CHEEK MELOCOTON. Large, roundish oval, with a point at the apex; yellow, with a deep red cheek, flesh juicy, with a good but not first rate flavor. Much valued as a market fruit. Glands globose, flowers small.

DRUID HILL. Large at the south, medium north, roundish, surface nearly white in the shade, with a fine red cheek, flesh very juicy, rich, and excellent. A fine late peach.

CRAWFORD'S LATE. Very large, roundish, sometimes slightly oval, deep yellow with a red cheek, flesh rich and juicy, nearly first rate. A valuable late variety. Glands globose, flowers small.

CLINGSTONES.

OLDMIXON CLING. Large, roundish oval, yellowish white, with a dotted red cheek; juicy, rich, excellent. Glands globose, flowers small.

LARGE WHITE CLINGSTONE. Large, round, white, dotted with red, or with a red cheek, juicy, sweet, rich, and high flavored. Glands globose, flowers small.

OLD NEWINGTON. Resembles Oldmixon, but not so good, and differs by its cut, glandless leaves.

LEMON CLING. Large, oblong oval, with a point at the apex, deep yellow, with a brownish red cheek, flesh firm, rich, vinous, sub-acid, second rate. Productive, hardy. Glands reniform, flowers small.

BLOOD CLING. Quite large, roundish oval, downy, dark, dull-purplish red, flesh deep red throughout, firm, only valuable for culinary purposes.

HEATH. Very large when not crowded, round when large, oval when small, downy, nearly white, very juicy, melting, sweet, with a high, rich, excellent flavor. Glands reniform. Fails to ripen far north, and sometimes poor far south.

NECTARINES.

[The nectarine, being nothing but a peach with a smooth or glossy skin like that of a plum, requires special protection from the curculio. When well grown, it is one of the most beautiful of all fruits, but successful crops are not common.]

HUNT'S TAWNY. Rather small, roundish oval, with a dark red cheek on pale orange, flesh orange. Quite early, but the leaves being cut and glandless, it often mildews badly.

EARLY VIOLET. Medium, roundish, dark purplish red, flesh whitish, much reddened at the stone, flavor very fine. Glands reniform, flowers small.

ELRUGE. Medium, roundish oval, mostly dark reddish purple, flesh greenish white, light red at the stone, fine flavored. One of the best.

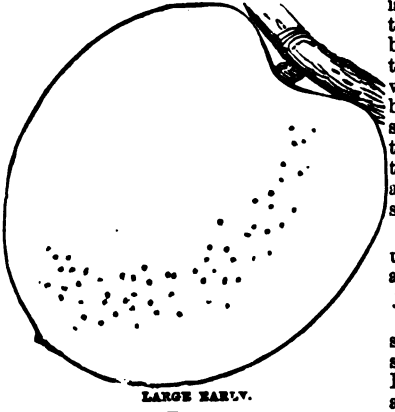
BOSTON. Large, very handsome, roundish oval, bright yellow and deep red, flesh yellow, pleasant, but not high flavored.

DOWNTON. Size medium, roundish oval, pale green and violet red, melting, rich, excellent.

STANWICK A new foreign sort of great excellence, but requiring a hot-house for ripening it is of little general value. When first introduced small trees sold at $50 each.

APRICOTS

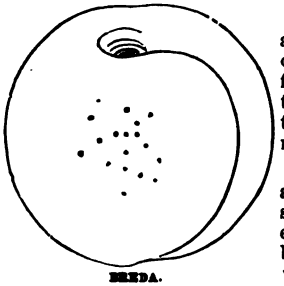
[The apricot is nearly allied to the plum, while it has a slightly downy skin like the peach. Being nearly a month earlier than early peaches, it is a fruit of great value, but the tree is liable to disease of the bark, and the fruit is much attacked by the curculio. To prevent the former, let the branches be low and plant on a dry subsoil; to destroy the curculio, turn in pigs and poultry when the young fruit begins to drop, and jar down and catch on sheets.]



LARGE EARLY.

LARGE EARLY. Full medium, oblong, pale orange, with a spotted orange cheek, rich, juicy.

EARLY GOLDEN. Small, smooth, wholly pale orange, sweet, good, free from the stone. Early, at mid-summer. Hardy and productive.



BREDA.

BREDA. Rather small, roundish, orange, with a reddish cheek, flesh deep orange, free from the stone, rich and high flavored. Growth hardy and vigorous, tree productive and valuable. Ripens at the north soon after or about mid-summer.

MOORPARK. Large, nearly round, orange with a red cheek, flesh free from the stone, yellowish orange, quite juicy, rich, excellent. Ripens soon after the Breda, but less hardy. Stone with a hole lengthwise under one edge.

PLUMS,

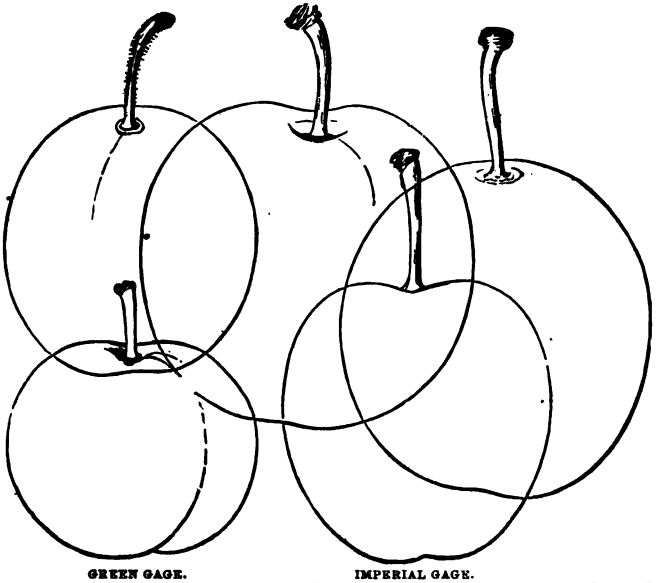
NEARLY IN THE ORDER OF RIPENING.

PRIMORDIAN, (or *Jaune Hative.*) Small, obovate, necked; pale clear yellow; with a rather sweet, mild, good flavor, very free from the stone—shoots very downy—growth slow, tree very productive. Valuable for its extreme earliness, ripening before wheat harvest.

IMPERIAL OTTOMAN. Nearly medium, oval, pale greenish yellow, marbled, juicy, sweet, excellent. Ripens two weeks after Primordian.

HOWELL'S EARLY. Rather small, oval, light brown, flesh juicy, sweet, perfumed, free from the small, oval stone Shoots slender, grey, downy. Productive.

IMPERIAL OTTOMAN. WASHINGTON JEFFERSON.



GREEN GAGE. IMPERIAL GAGE.

PEACH PLUM. Very large, roundish oblate, color light dull red—flesh rather coarse, juicy, sprightly—tree very productive—handsome and showy, valuable for early market.

EARLY ORLEANS. Medium, round, oval, reddish purple, flavor mild, rich. The *Orleans* is larger and later.

EARLY ROYAL. Medium, roundish, light purple, flavor rich, excellent—nearly free from the stone. Shoots very downy.

PRINCE'S YELLOW GAGE. Medium, oval, golden yellow, slightly clouded; flesh yellow, rich, sugary; shoots smooth.

HUDSON GAGE. Medium, oval; yellow, streaked with faint green, bloom thin, flesh juicy, rich, sprightly, excellent—nearly free from stone.

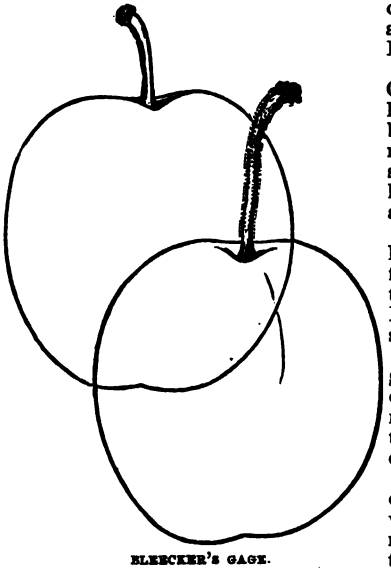
GREEN GAGE. Rather small, full round; green, becoming yellowish green, with brown dots and network near the stem; flesh pale green. melting, juicy, exceedingly sweet and rich—unequalled in flavor by any other plum. Shoots smooth, short, growth slow. There are many worthless and spurious sorts, of this name.

RED GAGE. Hardly medium, round-ovate, brownish red; flesh free from the stone, juicy, melting, with a mild, sweet, rich, agreeable and refreshing flavor.

LAWRENCE, (or Lawrence Gage.) Rather large, roundish oval, yellowish green; flesh, melting, juicy, rich, excellent, free from the stone. A very valuable sort.

LOMBARD (or Bleeker's Scarlet.) Medium or rather large, round-oval, violet red, flesh pleasant, of fine but not rich flavor, adhering to the stone.—Hardy and very productive.

LAWRENCE



BLEECKER'S GAGE.

WASHINGTON, (or Bolmar's.) Quite large, roundish oval, yellowish green, sometimes with a blush; flesh rather firm, sweet, mild, moderately rich, free from stone. Growth vigorous, leaves large. A general favorite—but apt to rot.

COLUMBIA. Quite large, nearly globular, brownish purple, flesh rather coarse, free from the stone—of good flavor.—Handsome and showy. Tree spreading.

JEFFERSON. Large, oval, greenish yellow, becoming golden yellow, sometimes faintly reddened; flesh nearly free from the stone, very juicy, luscious, excellent.

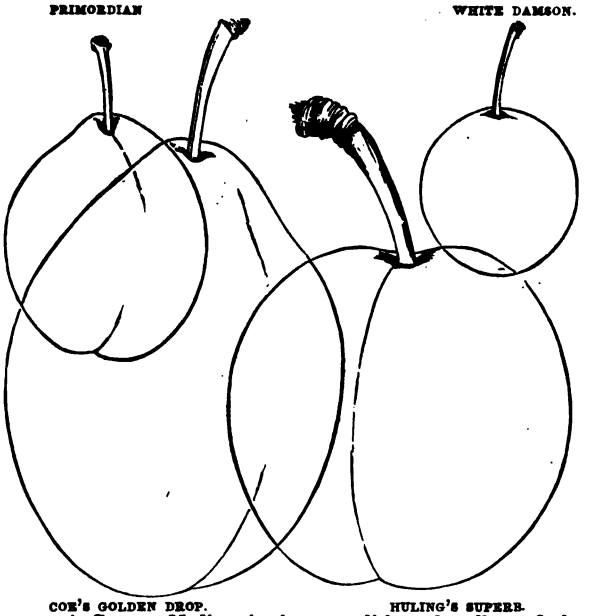
SMITH'S ORLEANS. Large, oval, reddish purple becoming very dark; flesh firm, juicy, rich—tree vigorous and productive—popular and profitable.

RED DIAPER. Large, oval, slightly necked; reddish purple, flesh pale green, melting and juicy, with a fine flavor, free from the small stone. Growth rather slow.

IMPERIAL GAGE. Rather large, oval. green and yellow, marbled, flesh juicy, melting, sweet and rich,—sometimes poor on heavy soils,—mostly free from the stone. Growth tall, tree very productive—highly esteemed.

DUANE'S PURPLE. Very large, oval, reddish purple, flavor moderate,—showy and productive.

PURPLE FAVORITE. Medium, roundish-obovate; brownish purple; flesh juicy, tender, melting, rich, sweet, and excellent, free from the small, roundish stone. Shoots smooth, short, growth slow.



BLEECKER'S GAGE. Medium in size, roundish oval, yellow; flesh rich, sweet, luscious, partly free from the stone.

BINGHAM. Large, oval, deep yellow, with red spots to the sun; flesh juicy, rich and fine—adheres to the stone. Handsome, productive and valuable.

MCLAUGHLIN. Rather large, roundish; russet yellow with thin red, flesh rather firm, sweet, rich, and of excellent flavor—adheres to the stone. A new valuable sort from Maine.

HULING'S SUPERB. Quite large, round oval, dull greenish yellow, flesh rather firm, adhering, rich, brisk, excellent. Leaves very large; moderate bearer.

ROYALE. Medium, round-oval, reddish purple, bloom very thick; flesh rather firm, with an excellent flavor. Shoots very downy.

PURPLE GAGE. Medium, roundish, skin violet, bloom light blue; flesh rather firm, rich, sugary, of very high and excellent flavor, free from the stone. Growth like the Green Gage. The genuine sort is rare—a spurious sort is often cultivated.

GERMAN PRUNE. Large, long oval, curved or swollen on one side, with a long neck; skin purple; flesh rather sweet, of moderate flavor, free from the long, curved stone. Valuable for drying and preserving.

REINE CLAUDE DE BAVAY. Round oval, greenish yellow—flesh rather firm, juicy, sugary, rich—adhering to the stone. A new Belgian sort.

ST. MARTIN'S QUETSCHE. Medium, ovate, pale yellow, flesh juicy, rich, excellent—keeps long—great bearer and profitable.

Coe's Late Red, (or Red St. Martin.) Medium, roundish, light purplish red; flesh rather firm, crisp, vinous, rich. A valuable late plum.

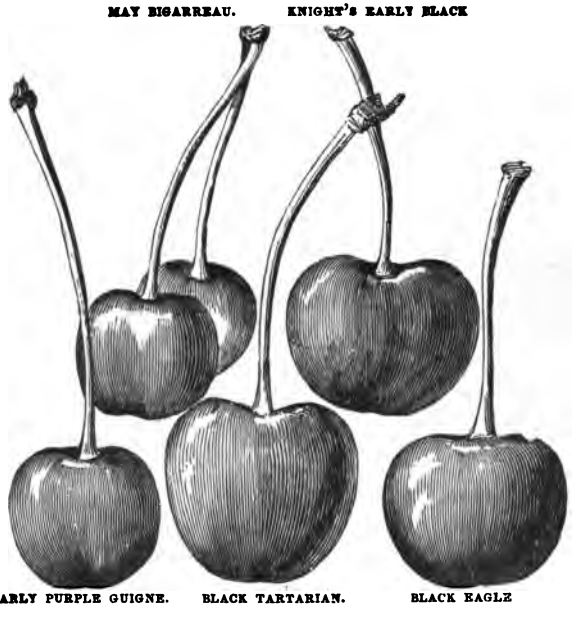
White Damson, (or Yellow Damson.) Quite small, oval, pale yellow, dotted with reddish brown; flesh rich, sub-acid, agreeable. A great bearer, and hangs long.

Coe's Golden Drop. Very large, oval, necked; yellow, often dotted red; flesh rather firm, rich, sweet, closely adhering to the stone. Does not always ripen at the north.

Frost Gage. Small, round-oval, deep purple, juicy, sub-acid, becoming sweet, of fine, but not the highest flavor; valuable for its lateness, hardiness, and great bearing.

Ickworth Imperatrice. Above medium, obovate, purple, flesh juicy, sweet and rich, very late, keeping into winter, becoming dryer and sweeter.

CHERRIES.



HEART AND BIGARREAU CHERRIES—IN THE ORDER OF RIPENING.

Early Purple Guigne. Size medium, round-heart-shaped, dark red, becoming nearly black; flesh tender, juicy, rich, sweet. Shoots spreading, leaves drooping—the best very early variety.

MAY BIGARREAU, (or Baumann's May.) Rather small, nearly round when ripe; deep red, becoming black, flesh rather sweet, not high-flavored.

BELLE D'ORLEANS. Size full medium, pale red, flavor excellent—valuable. New, from France.

DOCTOR. Medium, round-heart-shaped, light or yellowish red, flesh tender, sweet, fine-flavored. Raised by Dr. Kirtland, Ohio.

GOVERNOR WOOD. Large, heart-shaped, light red, tender, flavor excellent—unexcelled among cherries. Raised by Dr. Kirtland.

COE'S TRANSPARENT. Full medium, round, skin thin, pale amber, reddened in the sun with pale spots—melting, sweet, excellent.

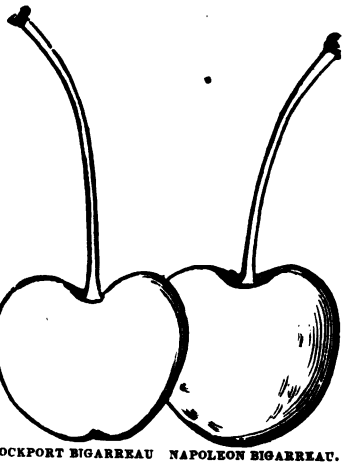
BLACK TARTARIAN. Quite large, heart-shaped, surface wavy, black when ripe; flesh sweet, mild, with a very fine flavor. Growth strong, upright; a great bearer—and generally popular.

KNIGHT'S EARLY BLACK. Large, roundish heart-shaped, nearly black when ripe, with a very rich, high flavor.

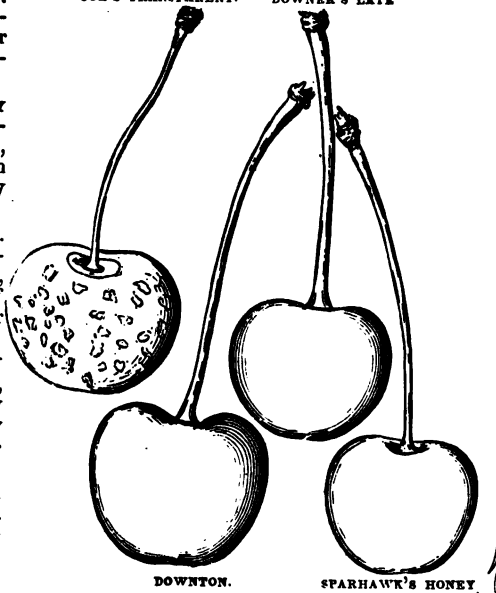
AMERICAN HEART. Full medium, roundish heart-shaped, light red, flesh half tender, with a rather sweet fine flavor.

GREAT BIGARREAU. Very large, heart-shaped, very dark red or nearly black, flavor excellent.

ELTON. Large, pointed heart-shaped—rather oblong, yellow with red; flesh firm, becoming rath

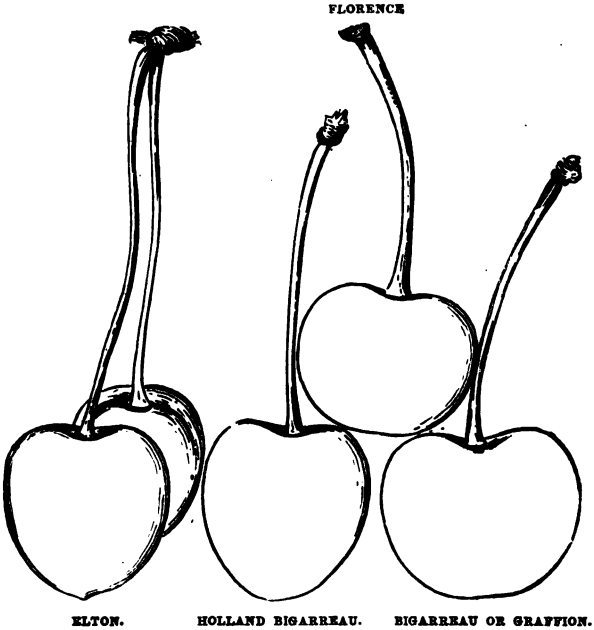


ROCKPORT BIGARREAU NAPOLEON BIGARREAU.



COE'S TRANSPARENT. DOWNER'S LATE

DOWNTON. SPARHAWK'S HONEY.



er tender, rich and high-flavored. Growth spreading—leaf stalks dark purple.

Rockport Bigarreau. Large, round-heart-shaped, clear red, flesh firm, sweet and rich, usually excellent, but often variable. Dr. Kirtland, Ohio.

Burr's Seedling. Rather large, heart-shaped, a fine clear red, flesh half tender, sweet, rich, with a fine flavor. Growth very handsome and vigorous.

Yellow Spanish, (Bigarreau, or Grafflon.) Very large, round-heart-shaped, very smooth, waxen yellow with a handsome red cheek—flesh firm, with a fine, rich flavor. Very popular—a moderate bearer in some localities.

Holland Bigarreau. Large, oblong heart-shaped, pale yellow with bright red to the sun—flesh firm, with a rather sweet and fine flavor.

Black Eagle. Rather large, roundish heart-shaped, nearly black, with a very rich, high, excellent flavor. Growth rather spreading, resembling that of the Yellow Spanish.

Downton. Large, roundish heart-shaped, a light yellow stained with red; flesh tender, rich, delicious.

Napoleon Bigarreau. Very large, heart-shaped, skin pale yellow, spotted and shaded with deep red; flesh very firm, with a fine but hardly first-rate flavor.

SPARHAWK'S HONEY. Size medium, round-heart-shaped, regular, a bright red when ripe; flesh juicy, delicate, sweet, with a very agreeable flavor. A great bearer.

FLORENCE. Large, roundish heart-shaped, smooth, amber yellow with a red cheek, flesh firm, rather sweet, fine—resembling Yellow Spanish but smaller and later.

DOWNER, (or *Downer's Late.*) Medium, round-heart-shaped, smooth, red, flesh melting, rich, very high flavored—hardy, productive, and very valuable.

DUKES AND MORELLOS.

MAYDUKE. Large, roundish, heart-shaped, nearly black and flesh dark purple when ripe; very juicy, rich, acid, excellent. Often varies much in ripening. Hardy everywhere.

BELLE DE CHOISY. Medium, round, skin thin, pellucid, yellowish red, with a fuller red in the sun; very tender, melting, with a fine, sub-acid, delicate flavor. Moderately productive.

EARLY RICHMOND, (or Kentish.) Hardly medium in size, round, color full red, very juicy, acid, moderately rich—hangs long and improves. Very productive, hardy, certain—fine for cooking.

REINE HORTENSE. Large, bright red, tender, juicy, slightly acid, flavor fine. Hangs long.

CARNATION. Large, round, yellowish red, mottled, with a mild, acid, rich and fine flavor.

BELLE MAGNIFIQUE. Quite large, roundish heart-shaped, a fine rich red, flavor mild, rather acid, rich; slow grower, but great bearer. Very valuable.

PLUMSTONE MORELLO. Large, roundish, heart-shaped, deep red; flesh reddish, of rich acid flavor. Stone large.

THE STRAWBERRY.

Modern cultivators divide all strawberries into two distinct classes, one being termed *staminate*, (or male,) in which the stamens are fully developed, and possess the power of fertilizing the germ; and the other being termed *pistillate*, (or female,) in which the stamens are abortive, or so small and imperfectly developed that they fail to accomplish fertilization. The accompanying figures, (figs. 1 and 2,) represent the usual appearance of these two kinds of flowers; and figs. 3 and 4, magnified portions of the same, fig. 4 exhibiting

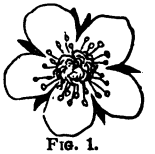


FIG. 1. STAMINATE.

FIG. 2. PISTILLATE.

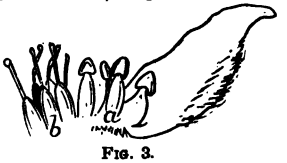


FIG. 3. PISTILLATE FLOWER, MAGNIFIED.

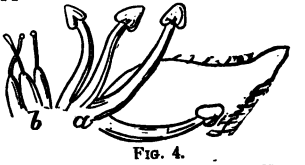


FIG. 4. STAMINATE FLOWER, MAGNIFIED.

a part of the flower of the Large Early Scarlet, and fig. 3 the same of Hovey's Seedling; *a* being the stamens, and *b* the pistils. By the use of a microscope it will be found that the former is abundantly supplied with pollen or fertilizing dust, while the latter is nearly or totally destitute. Hence Hovey's Seedling or any other pistillate variety, can never, or but very imperfectly, fertilize its own flowers, and the impregnation must be derived from a staminate sort.

A few staminates will fertilize many pistillates; and to prevent the intermixture of the two sorts by runners, they may be planted in alternate strips, as indicated in the following diagram. S representing staminate and P pistillate varieties.

P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P	PATH.	S	PATH.	P	P	P	P	PATH.	S	PATH.	P	P	P	P	PATH.	S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S
P	P	P	P		S		P	P	P	P		S		P	P	P	P		S	S	S	S

The principal requisite for success in the management of these beds, is clean cultivation, keeping the runners down by hoeing or treating them precisely as weeds.

VARIETIES

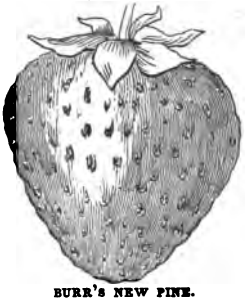
LARGE EARLY SCARLET. Size medium, sometimes large, roundish ovate, bright scarlet, of a rich, high flavor. Ripens at the north the first week or two in summer. Staminate.

LARGE EARLY SCARLET.

BURR'S NEW PINE. Large, roundish conical, regular in form, pale red, flesh very tender, of a mild and very excellent flavor. A great bearer. Pistillate. Quite early.

BOSTON PINE. Large — roundish — deep red, rather firm with a rich flavor. Needs good cultivation. Staminate. Early.

WALKER'S SEEDLING. Large, very dark red, with a fine flavor — productive and valuable. Staminate.



BURR'S NEW PINE.

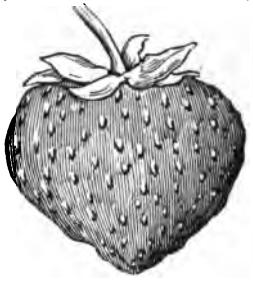
BLACK PRINCE. Large, roundish, of a very dark red, nearly black when ripe. Often very fine, but very variable—watery in wet weather—must be fully ripe. Pistillate.

HOVEY'S SEEDLING. Very large, roundish conical, color a fine scarlet, flesh rather firm, good but not high flavored. Often quite productive—and fine for market. Pistillate.

IOWA. Rather large, bright scarlet, acid, flavor moderate, hardy, strong, and productive; being a staminate variety, much valued as a fertilizer, as well as for market.

WALKER'S SEEDLING.

MOYAMENSING. Rather large, roundish conical — deep crimson, flavor fine, plant vigorous and productive. Pistillate. New. Originally from Pennsylvania.

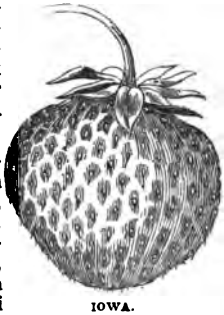


BLACK PRINCE.

HOOKER'S SEEDLING. A large new variety, originated at Rochester—dark red, resembling Black Prince, but superior in size, flavor, and productiveness.

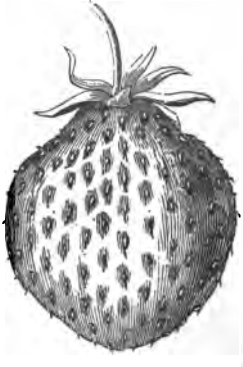
HOVEY'S SEEDLING.

McAVOY'S SUPERIOR. Large, often quite large, dark red, flesh soft, flavor fine. Berries often imperfect. A valuable sort, but does not sustain its high Cincinnati reputation at the North and East. Pistillate.



IOWA.

GENESEE.— Large, roundish, slightly necked, bright crimson, with a mild but fine flavor. A very handsome strawberry, and a fine bearer. Rather late. Raised by Ellwanger & Barry, Rochester.



GENESEE.

HUDSON, (or *Old Hudson.*) Size medium, roundish oval, rich red, firm, acid. A great bearer, and celebrated for market at Cincinnati. Pistillate.

The Rival Hudson, a new variety, resembles this, but is darker and rather superior.

CRIMSON CONE. Size medium, conical, color bright scarlet, firm, flavor rich, rather acid—hardy and vigorous—in most instances quite productive. Pistillate. Late.

GRAPES.

NATIVE.

CONCORD. Bunches very large; berries large, with a thick bloom, dark purple, round; flavor good, but not first-rate. A very showy and good grape, quite early, ripening some weeks before the Isabella. Will probably prove valuable for market. A new Massachusetts variety.

DIANA. A seedling from the Catawba, but paler and much smaller. Bunches and berries rather small, of a pale greyish red, almost without pulp, sweet, juicy and rich. A valuable and excellent new Massachusetts sort, nearly as early as the Concord.

YORK MADEIRA. Bunches and berries medium or rather small, juicy, sweet, and rich—resembles Isabella, but earlier, smaller, and freer from pulp. This was confounded by Downing with the Alexander, a very different and greatly inferior variety. A moderate grower.

CLINTON. Bunches and berries rather small, black, pulpy, juicy, with a rich, rather acid, and before fully ripe a harsh flavor. Very hardy, and a free grower.

ISABELLA. Bunches medium, berries round oval, dark purple, tender, with some pulp, and with a sweet, rich, slightly musky, excellent flavor. Vigorous, and very productive. The most popular sort at the North.

CATAWBA. Bunches medium or rather large, berries large, pale red, deeper in the sun; flesh slightly pulpy, juicy, sweet, rich, and very pleasant. Ripens well in the middle and western States, and is the great favorite at Cincinnati.

FOREIGN.

[There are many exotic varieties cultivated in graperies, but only a very few of the most common and best can be noticed here—some others being nearly or quite equal to them in quality.]

The *Black Cluster* is remarkable for its small very *compact* bunches, of small grapes, the flavor sweet and good. It is hardy, and will succeed in the open air. The *Early White Malvasia* is another sort succeeding tolerably well in open air; the bunches are rather large, the berries small, yellowish white, juicy, with a nearly sweet, agreeable flavor. The *White Sweetwater* has bunches of medium size and round berries, which are yellowish green, and are crisp, watery, sweet, rich, and very pleasant. It needs a glass structure, the berries soon becoming mildewed after the first or second year in open air. The *Royal Muscadine* or *Chasselas*, resembles the Sweetwater, but has larger berries, and a stronger growth. The *Black Hamburgh* is the most highly esteemed of all exotic grapes for house culture—the bunches and berries are large, becoming nearly black when ripe, the flavor sugary and rich. The *White Muscat of Alexandria* has large, loose bunches, and large oval berries, of a pale amber color when ripe—rather firm, crisp, and with a rich and delicious flavor. It is best when ripened with fire heat. The *Grizzly Frontignan*, which ripens before, and the *White Frontignan*, which ripens after the Hamburgh, are valuable foreign sorts—the former with medium sized, round, reddish gray berries, and the latter with rather large, yellowish berries, both with fine flavor. The *Black Frontignan*, is also a rich, and excellent, and productive grape.

CULTURE OF THE GRAPE.

PROPAGATION.

The vine is propagated by *seeds*, *layers*, *cuttings*, and by *grafting*.

Seeds are planted only for obtaining new varieties, by cross-fertilization.

Layers furnish a very sure mode of obtaining large well rooted plants the same autumn after the yóung shoots are buried in the soil, which may be done a little before midsummer.

Cuttings are less certain of success than layers, but are usually more convenient, and admit of more rapid multiplication. They should be a foot long and planted sloping, and should just reach up to the surface of the soil, which should be rich, deep, and rather moist. They strike more readily under a frame of glass.

Grafting is sometimes useful for changing large vines of worthless sorts to a better, and bearing fruit in less time than a young vine on its own roots. To prevent bleeding, the work must be done below the surface in the root; or after the leaves are expanded, the scions having been preserved in a cool cellar for this purpose.

SOIL.

"The essence," says Downing, "of all that can be said in grape culture respecting soil, is that it be *dry* and *light*, *deep* and *rich*." A dry bottom is highly essential; hence a bed of stones, shells and bones, eighteen inches beneath the surface, has been very useful. The manure must be in some degree adapted to the nature of the soil, but generally, vegetable mould or muck, with a portion of ashes intermixed, is one of the very best.

PRUNING AND TRAINING.

A well pruned vine will not only produce *earlier* fruit, but it will be larger, and incomparably superior, than on one left to straggle without care.

There are two leading principles that should be always observed in pruning the grape, whatever may be the particular mode adopted. The first is, that the vine *always bears its fruit on the present year's shoots*, which have sprung from buds on the previous year's growth, (Fig. 1.) Secondly, that the full growth and perfect ripening of the *fruit* depends wholly on healthy, well developed *leaves*, which supply food to the forming berries, and hence the growth must not be allowed to become so thick that the leaves cannot properly develope themselves, nor should the vines be trimmed so closely that there shall not be leaves enough for the perfection of the fruit. These two facts must be always borne in mind by those who would raise the best grapes. These being understood, we now proceed to the details of pruning.

First Year. When a vine is first procured from the nursery in spring, it is usually furnished with several irregular shoots of the previous summer's growth, resembling fig. 2. These should be all closely pruned to the older wood, leaving only the strongest, and this should be cut back so as to leave but two or three buds, fig. 3. These buds will grow, and when only a few inches in length, the strongest shoot must be selected, and the others rubbed off. This single shoot is allowed to grow till about the first

FIG 1.—VINE IN BEARING—PORTION REPRESENTING THE BEARING BRANCHES FROM THE SIDES OF A LAST YEAR'S VINE.

FIG. 2. VINE AS OBTAINED FROM NURSERY.

FIG. 3. SAME, PRUNED, WHEN SET OUT.

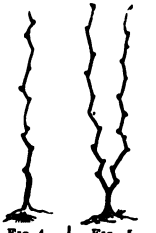


FIG. 4. END OF FIRST SUMMER.

FIG. 5. END OF SECOND SUMMER.

of autumn. After this period, the new leaves and wood that are formed, cannot mature perfectly, and their growth will be in some degree at the expense of the matter forming in the previous portion of the shoot. Its growth should be therefore stopped by pinching off the end. This will assist in maturing and strengthening the vine. Any *side-shoots* that appear during the summer, or any smaller shoots that happen to spring up from the stump, should be kept rubbed off as fast as they appear, as they withdraw and divide the nourishment received from the roots.

SECOND YEAR. The single strong shoot made the first year, (fig. 4,) should be cut down to three or four buds, only *two* shoots from which should be allowed to grow, the others being rubbed off, and the lateral shoots, should any appear, being removed as already described. The autumnal shortening of the two shoots as above stated is also necessary.

The judgment of the cultivator will teach him, that if the transplanted vine is small or weak the first year, and makes but a few feet growth, the same first year's process must be gone over again the second year, until the vine becomes strong enough to send up a shoot at least some nine or ten feet in length, when the "second year's" operation may be commenced upon it. Any fruit which sets should be removed, as the vine is not yet strong enough to bear and support a vigorous growth at the same time.

THIRD YEAR. The two shoots made during the second year, (fig. 5,) are now extended each way horizontally, and fastened to the newly erected trellis. This may be done at the end of the second year, or early in the spring of the third. These horizontal branches, termed *arms*, are to

be cut back at the same time, so as to leave two good buds on each, so that four shoots, two on each side, may spring up from them; the same care as formerly being observed to remove suckers or supernumerary shoots and side branches, and to give the autumn shortening. None of the fruit bunches should be allowed to remain. The four shoots, as they advance in growth, should be tied to the trellis, in the position that the figure represents.

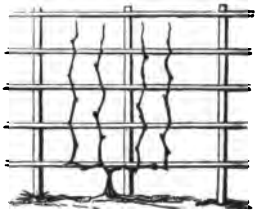


FIG. 6.—GROWTH AT END OF THIRD SUMMER.

FOURTH YEAR. Two shoots or canes are suffered to remain in their position upon the trellis, merely cutting them down to three or four feet. They will throw out from each bud side-shoots, which are the fruit-bearers, and on each of these spurs one or two bunches of grapes may be allowed to remain and ripen; the ends of these spurs or side-shoots being pinched off, as shown at *c*, fig. 1. All other bunches should be rubbed off as soon as they form. The other two or outer shoots, should, early in the same spring, (or late the previous autumn,) be laid down horizontally so as to form an extension or continuation of the *arms;* and at the same time be shortened to within about two feet of the ends of the previous arms. Two buds should be allowed to grow on each of these horizontal portions, one of which is to be trained up on the trellis for another bearing branch, and the other to serve for a continuation of the arms, as before, no bunches being allowed to grow on them. In this way, two new bearing shoots are added yearly, until the entire space intended for the vine on the trellis is filled.

We have already remarked at the beginning of the previous paragraph, that the two upright shoots are cut down to three or four feet. A bud should be allowed to grow at their upper ends, from which all bunches are to be removed, so that they may serve to extend their length upwards, till the full height of the trellis is attained.

There are two modes of treating vines trained in this way. One is what is termed *spur-pruning*, and the other the *long-cane* or *renewal* system. Theoretically speaking, there is but little difference between them, but they are quite different in practice. We have already remarked that the bunches are borne on the present season's shoots. In *spur-pruning*, these shoots are thrown out yearly from the sides of a *permanent* upright shoot, and are cut back yearly, for new ones to spring out from the buds left at their base in pruning.

In the *long-cane* or *renewal* system, every alternate stem is cut wholly down to the horizontal arm; so that, while last year's upright shoot is furnishing a crop of grapes this year,—this year's shoot is growing (free from all bunches,) for a similar crop for next year. No shoot, therefore, remains above the arms longer than two years.

Spur-pruning is best adapted to slowly growing sorts, (chiefly exotics,) which cannot produce a full length branch in one year. The renewal system is best for the most vigorous American varieties, which will grow fifteen or twenty feet in a year. Fig. 7 exhibits distinctly a vine trained to a trellis, and treated on the renewal system, the dark shoots being the present season's bearers, and the dotted lines showing the growth of the

canes for bearers next year, while new ones are growing on the places of this year's bearers.

Summer pruning, which consists in the removal of all supernumerary shoots and bunches as fast as they appear, and in pinching off the ends of bearing shoots, after enough leaves have formed, is of great consequence.

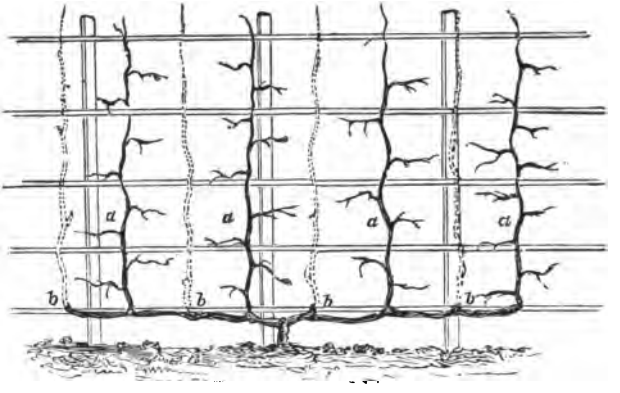


FIG. 7.—A FULL GROWN GRAPE VINE, TRAINED ON THE ALTERNATE OR RENEWAL SYSTEM —THE DARK VINES, THE PRESENT YEAR'S BEARERS—THE DOTTED ONES, GROWING THIS YEAR, FOR BEARING NEXT.

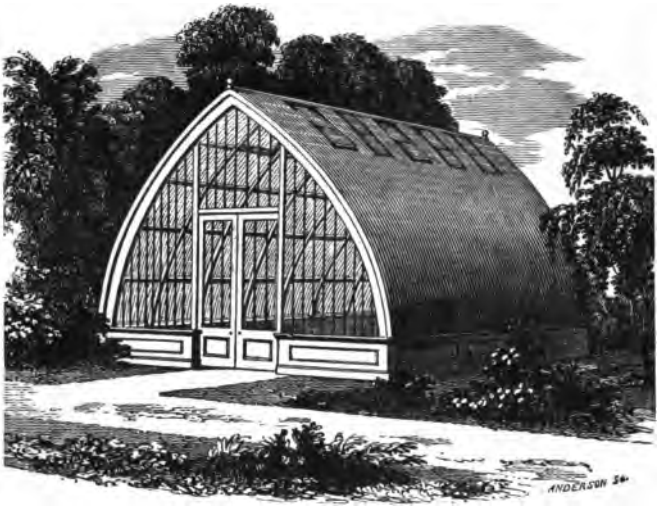
Vines left to themselves, even after a thorough spring pruning, soon have such a profusion of leaves and branches, that none can perfectly develope themselves, and the fruit is consequently small, the bunches meagre, and the ripening late. The summer pinching of the ends of the bearing shoots should be cautiously done, and not before the grapes are about half grown; four or five leaves at least should be left on every one, above the last bunch, and never more than two bunches be allowed on each bearing spur.

The old vine should never be allowed to rise a foot from the ground—the lower it is kept the easier the vine will be managed, and the freer it may be kept from suckers. Some of the best cultivators bury the old stump beneath the soil.

GRAPE HOUSES.

The preceding directions are intended to apply chiefly to the outdoor management of hardy or American grapes, although all the general principles apply to all kinds of grape culture. It rarely happens that the more delicate or exotic varieties are successfully cultivated in the open air for any length of time, and therefore the protection of glass becomes necessary, which gives highly improved fruit, and far greater certainty of a crop. At the same time, a considerable amount of attention is requisite during the period of growth and ripening.

Grape houses are of three kinds, the *cold house*, which only protects from the exterior changes of the weather, and retains the heat of the

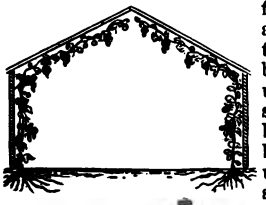


COLD GRAPE HOUSE.

earth and of the sun; the *forcing house*, used for ripening early grapes by the assistance of artificial heat; and the *late house*, to be also heated artificially, to ripen, during winter, the later varieties.

The best cold houses are made with *span-roofs*, as in fig. 1; while the *lean-to* house, fig. 2, is best adapted to forcing, affording better security against the admission of cold. For this purpose the latter should also have a double wall at the back. To admit the free passage of the roots under the walls, the border being on both sides, the posts should be either stone or brick piers, set deep enough in the ground to be unaffected by frost, and the walls built upon thick connecting slabs of stone near the surface. Posts of durable timber will last many years, when the structure is built of wood. In the latter instance, the back wall should be double-planked, and the space between filled with closely rammed dry tan. The sashes for the roof should be of two lengths, lapping slightly at the middle, and sliding past each other in separate grooves.

FIG. 1.—SPAN-ROOF GRAPERY.



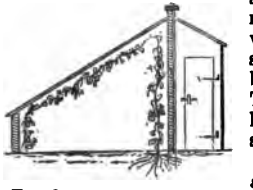


FIG. 2.—LEAN-TO GRAPERY.

A great improvement in *cheapness of construction* for the *cold grape house*, is represented in the annexed figure, (fig. 3 on opposite page.) The walls are made by setting posts into the ground, and

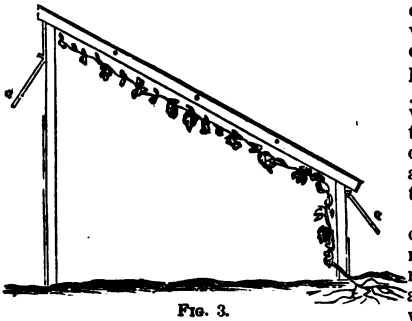


Fig. 3.

covering with a rough, white-washed, board siding. The cover of glass is greatly simplified and cheapened, by *fixed sashes*, the necessary ventilation being effected by the board shutters, *a a*, opening outwards on hinges, and placed at intervals along the back and front walls.

Fig. 4 represents a portion of the glass roof—*b b* are the rafters; *c c* are cross bars, made of strips of inch board about two and a half inches wide, set on edge, and narrowed at the rafter and let into it sufficiently to be on a level with its top. These cross pieces support long slender bars parallel with the rafters, and formed on the top in the shape of a common sash-bar and to receive the glass.

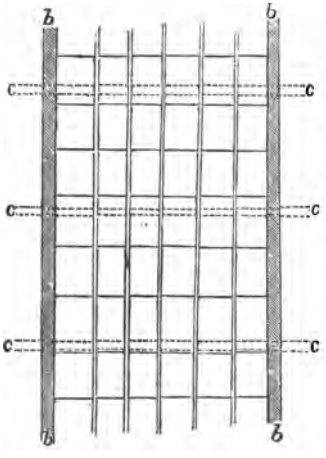


Fig 4

The leading figure on page 284 represents a very neat and tasteful cold grape house, erected by H. Ingersoll, near Pdiladelphia. It is 18 feet by 43½ feet, and 14 feet high; was built of the best materials, by mechanics at city prices, and cost $500.

Border for the Vines. This should never be less than 12 feet wide, and if 20 or 25 feet it would be better.—The roots of grape vines run rapidly to a great distance, and it is indispensable to their successful growth to furnish them ample room for extension. J. F. Allen, of Salem, Mass., a most successful cultivator, in his Treatise on the Grape, recommends for a border, a mixture of one-half loam, or the top soil of an old pasture, one-fourth bones or other strong manure, one-eighth oyster-shells, lime, or brick rubbish, one-eighth rotten stable manure—varying with circumstances. The bed should be well mixed, and should be two to three feet deep.

The same work states the cost of a cheap lean-to grape house, without fire heat, 12 or 14 feet wide, at about eight dollars per running foot; and with the addition of a heating apparatus, at ten dollars per running foot, constructed as cheaply as possible.

It would be impossible, within the space of a few pages, to give full directions for the management of a grape house. The following brief instructions, from A. J. Downing, contain all that is essential for a cold house:

ROUTINE OF CULTURE.

"In a vinery without heat this is comparatively simple. As soon as the vines commence swelling their buds in the spring, they should be carefully washed with mild soap suds, to free them from insects, soften the wood, and assist the buds to swell regularly. At least three or four times every week, they should be well syringed with water, which, when the weather is cool, should always be done in the morning. And every day the vine border should be duly supplied with water. During the time when the vines are in blossom, and while the fruit is setting, all sprinkling or syringing over the leaves must be suspended, and the house should be kept a little more closed and warm than usual, and should any indications of mildew appear on any of the branches, it may at once be checked by dusting them with flour of sulphur. Air must be given liberally every day when the temperature rises in the house, beginning by sliding down the top sashes a little in the morning, more at mid-day, and then gradually closing them in the same manner. To guard against the sudden changes of temperature out of doors, and at the same time to keep up as moist and warm a state of atmosphere within the vinery as is consistent with pretty free admission of the air during sunshine, is the great object of culture in a vinery of this kind."

GENERAL RULES

FOR PLANTING AND MANAGING FRUIT TREES.

1. The first or preliminary requisite is a good, rich, deep, dry soil.

If inclining to be wet, or if the subsoil is too moist, it must be well underdrained, for a common but unknown cause of bad growth and poor fruit, is hidden, stagnant water in the soil.

If not naturally very fertile, it must be enriched by manuring—and this is best if done for a year or two before planting, that it may be well incorporated. Subsoiling and trench plowing should be performed in connexion with the process of working in the manure, and it should be thoroughly intermixed by intermediate harrowings. A deep soil, besides causing a more rapid growth and finer fruit, is less affected by drouth and by heavy rains.

2. The second requisite is a good enclosure. The young trees must be protected from injury by cattle, and the fruit afterwards from the depredations of boys. A strong common fence will answer for the former, but an Osage hedge, with its numerous thorns may be required for the latter, although a good watch-dog is valuable. A hedge planted when the trees are set, and well managed, will form a good protection by the time the trees bear much, but there should be a good barrier for cattle before the first tree is planted.

3. The third point of importance is to procure and set out the trees. The lists we have given in the former and present numbers of THE REGISTER, will assist in making a good selection. They should be carefully dug up with a full supply of small roots. The holes should be large—not less than four feet in diameter, and in setting, it should be filled with the best rich mellow earth, but no manure should touch the roots. If any manure

is used, it should be old or rotted, well mixed in with earth, and placed in a remote part of the hole. The broken roots should be all pared off with a sharp knife. All the roots should be carefully spread out with the fingers while filling, and before the hole is quite full, the fine earth should be settled among all the interstices by pouring in water. The trees should be placed no deeper than they stood before, allowing an inch or two for settling. All except small trees need staking to protect them from the wind.

4. The after management consists in keeping the surface mellow and clean and in preserving the moisture. A well mellowed surface rarely besomes dry, but if watering is ever needed, the top earth should be removed, the water poured directly among the roots, and the earth again replaced. But a better way is to mulch, or cover the surface six inches deep about the tree, with old straw or other litter.

5. The subsequent growth of the trees will greatly depend on clean and mellow cultivation. Generally, young trees will grow from *ten* to *twenty* times as fast when cultivated, than if suffered to grow among weeds and grass. Spading a small circle round the tree answers the purpose poorly, as the roots are usually as long as the tree, and the cultivation must be *broadcast* to impart full benefit.

6. *Depredators.* *Mice* are excluded by banking up a foot around every tree, late in autumn—*birds* from cherries by shooting—*curculios* are destroyed by jarring down on sheets and also by turning in pigs and geese—*caterpillars*, by lime wash—*borers* by punching to death in their holes with a small twig—and the *peach worm* by cutting out with a knife, &c.

The *fire-blight* in pears, needs a prompt excision of the affected branches—the *yellows* in the peach requires the whole tree to be destroyed—and the *black-knot* in the plum is kept off by *continued* amputation, *beginning in time.*

ORNAMENTAL PLANTING.

In The Rural Register of last year, a number of suggestions were given in relation to the arrangement and treatment of ornamental trees,

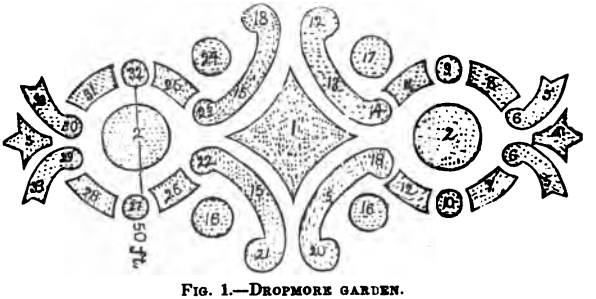


Fig. 1.—Dropmore garden.

which need not be repeated. We may remark, however, that success in planting, and a rapid, handsome, and luxuriant growth, require the same

care in providing a deep fertile soil, and in giving them for some years subsequently, a high, rich, and mellow cultivation, that is so indispensably required for fruit trees, and which we have already pointed out.

There are several modes of planting and managing the grounds about a dwelling. When the place is large, and several acres are devoted to this purpose, large or *park* trees are to be introduced, and the grass may be kept short and in good order by pasturing with sheep; leaving a small space immediately about the house, separated by a stiff wire fence, and which may be more neatly kept. Smaller grounds may be planted with small trees and shrubs and the ground be mostly covered with grass, which is neatly mowed once a fortnight — according to the plan described for gardens on p. 35 of last year's REGISTER. Still smaller grounds, when economy in labor would be less an object, and where it is desirable to make the most of their limited extent, may be nearly all occupied with flower beds in the geometric style, which admits a more compact arrangement. The accompanying figures are two examples of this sort. Fig. 1 represents the form and disposition of the beds in the celebrated *Dropmore* garden, England; and fig. 2 another in the form of a circle. If the walks are 3 feet wide, the circle will be 75 feet in diameter. It may be reduced by omitting any portion of the exterior.

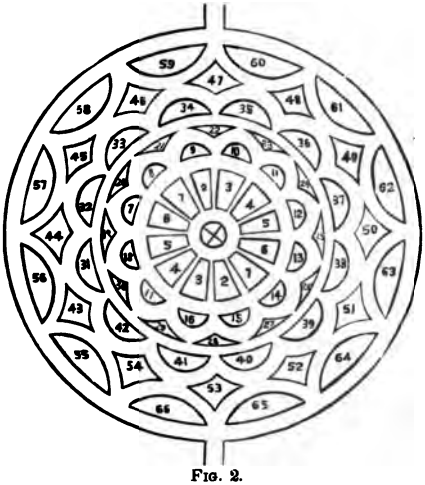


FIG. 2.

CEDAR OF LEBANON.

SELECT LIST OF TREES AND PLANTS—HARDY.

PARK TREES. The *Oak*, (of which there are many species;) American *Elm*; *Maples*, including the sugar, black, red, Norway and silver; Catalpa; *Chestnut*; *Black Walnut*; White *Ash*; *Tulip Tree*; European

Larch; White *Horsechestnut*; Cucumber *Magnolia*; *Basswood*; American *Cypress*. EVERGREENS—*Norway fir*; *Hemlock*; *White Pine*; *Balsam fir*; American *Arbor vitæ*. The *Deodar* and *Cedar of Lebanon* are hardy if shaded from the sun.

SMALL TREES AND LARGE SHRUBS. *Weeping Ash*; *Judas tree*; *Laburnum*; *Mountain Ash*, American and European; *Virgilia*; *Fringe tree*, purple and white; scarlet, pink, and white *Hawthorn*; *Silver Bell*; *Althea*; *Philadelphus*, (Syringo,) several species; *Snowball*; Common and Siberian *Lilacs*; *Cornelian Cherry*; *Euonymous* or burning bush; *Chinese White Magnolia*; *Soulange's Purple Magnolia*.

SMALL SHRUBS. *Japan quince*; dwarf *Flowering Almond*; *Sweet Scented Shrub*; Pink *Mezereon*; Yellow *Jasmine*; Japan *Globe-flower*; *Crimson Currant*; Tartarian *Honeysuckle*, white, pink, and striped varieties; *Spiræa*, several shrubby species; *Magnolia obovata*; Tree *Pœonia*; *Barberry*; *Deutzia scabra*; and all the finer hardy *Roses*.

DEODAR CEDAR.

CLIMBING SHRUBS. *Honeysuckles*, several species; *Bignonia*; *Aristolochia*, (or Dutchman's pipe;) *Clematis*, several sorts; *Ayrshire Roses*; and *Baltimore Belle*, *Queen of Prairies*, and other *Prairie Roses*.

EVERGREEN SMALL TREES AND SHRUBS. *Tree Box*; Common *Juniper*; *Red Cedar*; *White Spruce*; *Irish Yew*.

HERBACEOUS FLOWERING PLANTS.

In order to have a handsome succession of flowers through the season, *bulbous* flowers must be selected for the earliest bloomers; other *herbaceous perennials* for their successors; and some particular bulbous plants, *annuals*, and green-house plants, for late summer and autumnal flowering.

PERFECT PANSY.

PERFECT TULIP.

TIGER FLOWER

The *earliest bulbous flowers* are *Snowdrop*, single and double; *Bulbocodium vernum; Crocus*, several colors; and *Siberian Squill;* all of which appear in bloom as soon as the snow disappears from the ground. They are followed by several very early herbaceous perennials, among which are the *Claytonia*, the *Hepatica*, *Adonis*, *Wood Anemone*, *Phlox subulata* or moss pink, *Pansies*, *Cowslip*, sweet scented *Violet*, creeping *Phlox*, *Dodecatheon*, *Erythronium*. About the same time with some of these, appear the *Hyacinths*, *Daffodils*, *Jonquills*, succeeded by the numerous and brilliant varieties of the *Tulip*. The last is followed by a rapid succession of herbaceous perennials, some of the finest of which are the *Veronicas*, the earlier *Phloxes*, the *Lupins*, the *Iris* of many sorts, the *Columbines*, the oriental and Caucasian *Poppy*, and the magnificent varieties of the herbaceous *Pæonia*. The mid-summer flowers are the herbaceous *Spiræas*, among which the *S. lobata* and *S. aruncus*, are especially showy; the *Cypripediums*, the *Lychnis*, the Chinese *Larkspur*, the peach-leaved and large flowered *Campanulas*, the *Clematis erecta*, the *Aconites*, several *Pentstemons*, *Dictamnus*, *Dracocephalum*, *Lythrums*, *Coreopsis*, *Liatris*, several *Phloxes*. *Yucca*, &c.

GLADIOLUS FLORIBUNDUS.

Among the most interesting *summer flowering bulbous plants*, are the *Gladiolus communis*, or common purple sword-lily, which is perfectly hardy; the *Gladiolus floribundus* or profuse-flowering sword-lily, remarkable for its beautiful flesh colored flowers, but being tender, requires taking up before winter, and preservation from frost; and *Gladiolus gandivensis*, or Ghent sword-lily, with flowers of a rich orange scarlet, and also tender like the last. The *Tiger flower*, remarkable for its beautiful and showy petals, blooms about the same time, and requires similar treatment on account of its tender character. The *Japan lilies*, equally showy, are quite hardy.

Flowers in autumn are obtained largely from the successful culture of *annuals*, and from the hardier green-house plants, commonly known as *bedding plants*, among the most successful and desirable of which are the *Verbenas* and *Salvias*. The *Chrysanthemums*, including the dwarf or "pompone," flower almost into winter. They are hardy. and will succeed if planted in open ground, with a shelter, and full exposure to the sun during the latter part of autumn.

BUTTER AND CHEESE MAKING.

WRITTEN FOR THE REGISTER, BY JOSEPH HARRIS.

It is not our purpose to consider general dairy management. It is too important a subject to be discussed in the few pages allowed for this article. We shall take it for granted that the cows are properly managed; that in winter they are carefully sheltered from fierce blasts and piercing cold, and provided with abundant nutriment in the form of hay, cornstalks, straw, roots, &c.; that in summer they have the run of a good range of pastures, stocked with the best natural and artificial grasses, with a constant supply of pure water and grateful shade; that they are milked regularly and thoroughly, and treated with all gentleness; never whipped or harshly spoken to; never driven too far or too fast, or irritated or frightened in any way. We take it for granted that *good milk is obtained*, and that it is the object of the dairyman to get from it the butter and cheese which it contains.

The quantity of butter and cheese in milk, varies materially, according to the age of the cow, breed, and distance from calving, the nature of her food and general treatment. HENRY & CHEVALLIER found in the biestings or first milk, 15 per cent. of casein or curd, and only 2¼ per cent. of butter. The same chemists give the following as the average composition of ordinary cow's milk: casein or curd, 4.48 per cent.; butter, 3.18; sugar, 4.77; saline matter, 0.60; water, 87.02. The average of five determinations made by BOUSSINGAULT, with milk from a French cow, fed each week on different food, for five weeks, was: casein, 3.24 per cent.; butter, 4.06; sugar, 5.38; saline matter, 0.19; water, 87.13. The average of four determinations of milk from a Swiss cow, fed on different food each week for a month, was: casein, 3.75 per cent.; butter, 3.75; sugar, 4.75; saline matter, 0.28; water, 87.47. The average of nine analyses of milk from a Short horn cow, made by Dr. PLAYFAIR, was casein, 4.17 per cent.; butter, 5.00; sugar, 4.12; saline matter, 0.54; water, 86.17. The average of these 18 analyses is: casein, 3.91 per cent.; butter, 3.98; sugar, 4,76; saline matter, 0.40; water, 86.95.

Casein, or pure curd, is almost identical in composition with the albumen of grass, roots, hay, &c.; with the legumin of peas and beans; with the gluten of wheat, &c., and with all the so called protein compounds of oil cake, bran, linseed, corn, barley, oats, and all substances used as food. These foods also contain oil or butter, as well as starch or sugar; so that we find in milk precisely the same substances as in grass, hay, roots, grains, &c. In view of this fact, some writers have supposed that, by selecting food containing more or less albumen or oil or starch, we might, by using the body of the cow as a machine, obtain at pleasure milk containing more or less cheese, butter, and sugar. So far, the experiments which have been made show this idea erroneous. It is found that substances rich in albuminous matter, and which according to this idea should produce milk rich in casein or curd, have precisely the opposite effect, and give milk relatively deficient in casein and rich in butter.

Milk when drawn from the cow is always alkaline; it contains free soda. Casein or curd is insoluble in pure water, but readily soluble in water containing free soda. It is the soda of the milk, therefore, that keeps the curd in solution. The oil or butter is contained in little bags or films of casein,

and is not dissolved, but simply suspended in the water. The sugar and saline matter are of course held in solution. Such is milk when drawn from the cow. By allowing it to cool and remain quiet for a short time, the little bags of butter, being specifically lighter than the other portion of the milk, rise to the surface, and are known as cream. Other changes soon take place. The milk coagulates, and at a warm temperature speedily becomes perceptibly sour. The cause of this is very simple. At a proper temperature, by the absorption of oxygen from the atmosphere, the casein undergoes a slight transformation, and reacts on the sugar of the milk, converting it into lactic (milk) acid. This acid immediately unites with the soda, which holds the curd in solution, neutralizing it, and forming lactate of soda, while the casein being insoluble in water, is precipitated, or, in common parlance, the milk becomes curdled. The conditions favorable to fermentation—heat, light and moisture—are therefore unfavorable for preserving milk sweet.

Milk can be instantly curdled by the addition of an acid, and in some countries spirits of salts (hydrochloric acid) and vinegar (acetic acid) are used instead of rennet for "setting the cheese." In these cases the soda which holds the casein in solution is neutralized by the acids, and the curd immediately becomes insoluble, and is separated from the whey as in ordinary cheese making. Cheese so made, however, is hard and unpalatable.

The only way to make good cheese is to produce lactic acid from the sugar of milk by fermentation. A great variety of means are employed for this purpose. As we have said, the casein in milk will of itself change the sugar into lactic acid and curdle the milk; but before it does this it has itself begun to ferment under the influence of light and heat, and by the absorption of oxygen from the air. If curd be exposed to the atmosphere for a few days, and then added to milk, it coagulates it as quickly as rennet, and is often used for this purpose. A number of vegetable substances, such as the juice of the fig or thistle, a decoction of the dried flowers of the artichoke or thistle are also used as rennet. All animal substances in a certain state of decomposition will convert the sugar of milk into lactic acid, but, although pig's bladder is still used in some countries in Europe, it is generally conceded that the stomach of the calf, properly prepared, is the best substance for this purpose.

When fresh, the membrane of the calf's stomach is insoluble in water, but when it is salted and kept for several months exposed to the air, a portion of its surface is decomposed, and becomes soluble. It is this soluble, decomposed, or more properly *decomposing* membrane, which is the active principle in rennet. It is a soluble, highly nitrogenous substance, having its elements in a disturbed state, and therefore highly effective in inducing change in the elements of other bodies with which it is brought in contact.

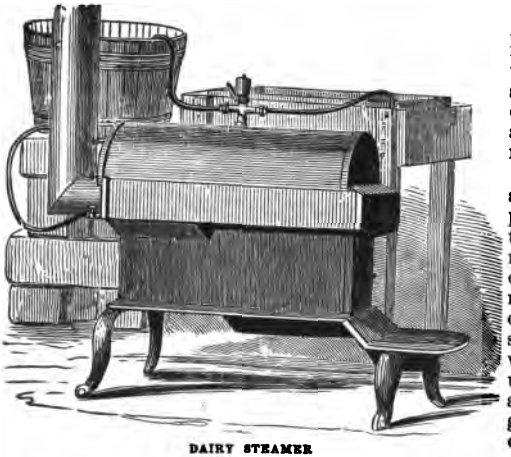
In preparing rennet, we have to check the natural decomposition of the stomach by the use of salt, otherwise it would communicate an unpleasant flavor to the cheese; but at the same time keep the salted stomach long enough to permit its elements to become disturbed by the action of the atmosphere. In Cheshire, Eng., the skins are cleaned out, and packed away with salt in an earthen jar till the following year. They are taken out a month before use, stretched on pine sticks, and dried. A square inch of the skin for each 15 or 20 gallons of milk is soaked for 24 hours in

a solution of lukewarm water and salt, and the whole poured into the milk and well stirred. In Gloucestershire, the cleaned stomach is salted, and pickled, and dried; and when at least a year old, it is well sodden in salt water; half a pint of which is sufficient to coagulate 50 gallons of milk. In Ayrshire, *the contents of the stomach are preserved;* they are well salted, both inside and out, and dried for a year or more; and when needed for use, the whole is chopped up and placed with salt in a jar, along with water and new whey, which after two or three days, is strained to remove impurities, and is then ready for use. In the dairy districts of this State, the stomach is emptied of its contents, salted and dried, without scraping or rinsing, and kept for one year. It is then soaked for 24 hours in tepid water—a gallon of water to each rennet. They should be frequently rubbed and pressed to get out all the strength. The liquor containing the soluble rennet, is then saturated with salt, allowed to settle, and strained to separate the sediment and all impurities. It is then fit for use. It should be kept in a stone jar, and in a cool place. As much of the liquor is used each morning as will set the cheese firm in 40 minutes. We have visited many excellent English dairies where the same system is adopted. It is, in our opinion, better than placing the rennet itself in the milk. The stomach may again be salted, stretched, and exposed to the air for some months, when it can be used over again—a fresh portion of the membrane having been decomposed by the air and rendered soluble. This fact, and others that might be mentioned, sufficiently prove that it is not the *gastric juice* of the stomach that is the active ingredient of rennet in coagulating milk.

As cheese making is a fermenting process, it is influenced materially by heat, proceeding within certain limits, faster or slower as the temperature is raised or lowered. In England, the milk is generally raised to a temperature of 85° Fahr. before adding the rennet. In this country it is set cooler, and raised to a higher temperature after the milk is coagulated. This is called "scalding." The word is a bad one, calculated to mislead. To "*scald the curd*" would be to spoil the cheese; but all that is meant by the phrase is raising the temperature of *the whey and curd* up to about 100 Fahr. This "scalding" process has many advantages; among others, the cheese requires less pressure, and the milk can be set at a much lower temperature—say 80° Fahr.

Scalding should be done with great care and nicety. Formerly it was done by heating a portion of whey, and pouring it into the cheese; but there is danger of injuring a portion of the cheese by over-heating it. A much better method is now generally adopted by the dairymen in the northern counties of New-York, and it is one of the greatest improvements in cheese making we have seen. What our English friends call the "cheese tub," is made of tin, and is placed in a wooden frame, so fixed that it can be surrounded by hot or cold water as desired. The evening's milk is strained into this tin, as it is brought in warm from the cows; and is kept cool by allowing cold water to run round it. The morning's milk is added to the cooled evening's milk, and if not then sufficiently warm to add the rennet, warm water is poured round the tin till the proper temperature is attained. There is some difference of opinion on this point: we know good dairymen who add the rennet to the milk at 80°, and others not till it is as high as 90°. The curd should come in about 40 minutes. Shortly afterwards the curd is cut up with a "cheese breaker,"

and then the temperature is gradually raised by pouring warm water round the tin. Many err by raising the temperature too fast. It should not be increased more than a degree in five minutes.

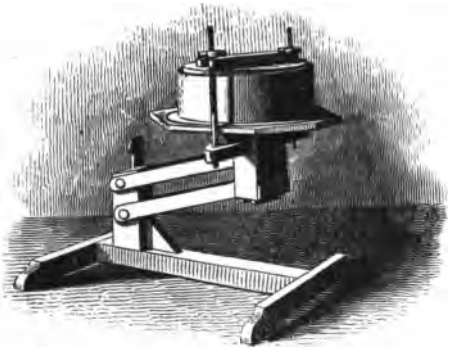


DAIRY STEAMER

In many dairies, a steamer is employed for heating the water surrounding the tin, containing the milk, or whey and curd, as also for supplying hot water for washing utensils, &c. The accompanying engraving will give a correct idea of it.

DICK'S CHEESE PRESS.

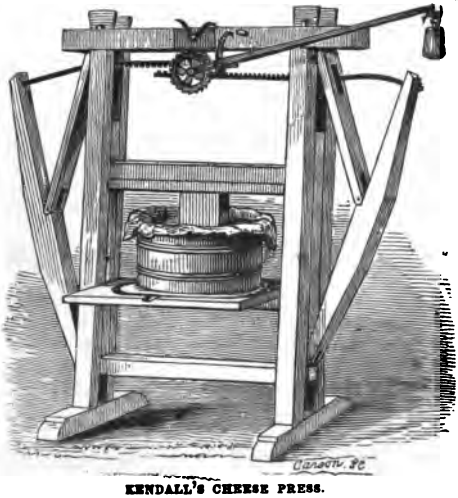
The English method of separating the whey from the curd by allowing it to settle, and dipping off the whey, is too slow for an intelligent go-a-head American. A lattice frame work, on which a large cloth is spread, is fitted into a sink, connected by a pipe with the receptacle for the whey, or pig cistern. The whey and curd are dipped on to this cloth, the whey running through in a few minutes, leaving the curd on the cloth. A little cold water is then poured on to the curd to keep it from packing. Some, however, prefer to cool whey and curd together, by putting cold water round the tin. When the whey has all drained away, the curd is broken up fine and salted. It is then placed in a cheese hoop and pressed for 24 hours.



PATENT SELF-ACTING CHEESE PRESS.

There are a number of excellent cheese presses, but probably none superior to that invented by Mr. DICK.

The Self-Acting Press, so called because the weight of the cheese is the power which creates the pressure, is frequently used in small dairies.



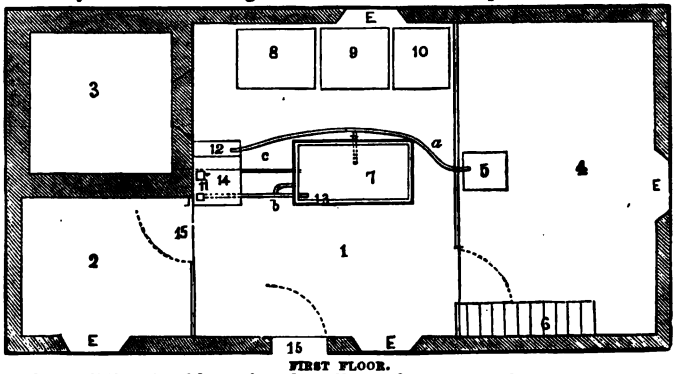
KENDALL'S CHEESE PRESS.

In the dairy districts of this State, Kendall's Cheese Press would appear to be the most popular, being cheaper than Dick's, and more efficient than the Self-Acting Press. A weight of 20 lbs. at the end of the lever gives a pressure of 10 tons. In all presses, it is very desirable that the pressure should faithfully follow the cheese as it shrinks.

Cheshire dairymen, as a general thing, do not scald their curd, and hence much more

care is needed in salting and pressing than in the process we have described. After the curd is separated from the whey, it is put under a hand press for an hour or two, and as much of the whey expressed from it as possible *previous to salting*. When taken from under the hand press, it is broken quite fine by hand, and salted. It is then put in the cheese hoop, and pressed slightly for six or eight hours. It is then taken from under the press, pierced with a wooden skewer, in order to open channels for the exudation of the whey, covered with a clean cloth, and put under a heavy pressure till next morning, when a clean cloth is again put round it, and a heavy pressure applied till it will no longer wet the cloth. Cheeses are frequently left under the press three or four days. "Scalding" expels the whey from the curd more effectually than can be done by the most powerful and long continued pressure, but it is a question whether at the same time it does not destroy some of the desired flavor of the cheese. If our dairymen should "scald" less and press more, their cheese would be more highly prized, at least in the English market.

The following plan for a dairy house, is given by GURDON EVANS, in *The Cultivator*. "It is arranged for cheese making, though it will be found equally convenient for butter making, by substituting the furniture necessary for butter making for that described in the plan."



FIRST FLOOR.

The building should consist of a cellar and one story above; the former, settled about three or four feet below the surface, provided with a drain, emptying if possible into the slop-tub in the cow barn. The wall of the cellar, and both stories, if convenient, should be of stone or brick, laid in lime mortar, and from 18 to 24 inches thick. The bottom should be of water-lime mortar, which will, when properly prepared, soon harden into a level smooth surface, quite imperishable, and be proof against water, and all rats and mice. The pipes, leading to and from the cisterns, &c., should be laid down before the floor is laid, and the mortar carefully fitted to them. The ice house should be plastered with water-lime, and a little space left between the ice and bottom of the house, to allow the water a small space. The top and side walls of the dairy house should be finished with plaster, by which means a uniform temperature, indispensible to curing cheese well, is more easily secured. Size, 18 by 30 feet outside.

First Floor.—1. The room for making cheese in, 14 by 18. 2. Closet 10 by 10, provided with shelves, for storing all sorts of furniture.

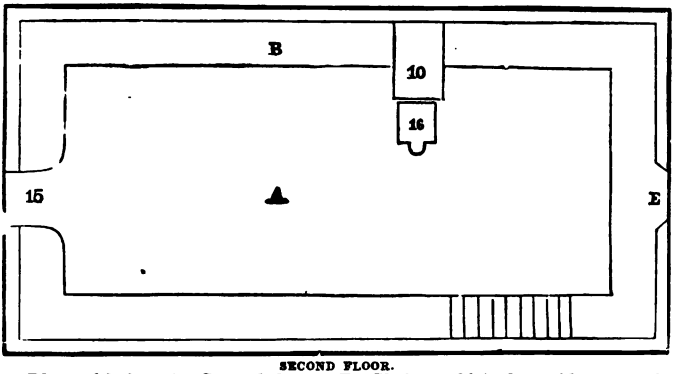
3. Ice house, 10 by 10. This should be enclosed by double walls, and great care taken to make both perfectly air tight, and the space may be filled with sand, leached ashes, or almost any dry porous substance; but nothing is so good as air, provided it is not permitted to circulate in and out of the space, because air when not in motion is almost a non-conductor of heat; but since cold air is *heavier* than warm, if crevices are left near the bottom of the ice vault, the cold air contained in it, as soon as the temperature without is raised, flows out, and its place is supplied by warmer air passing in at the same crevices, and an equilibrium is soon restored between the temperature of the air without and within the ice house, and the ice rapidly wastes away. For this reason the door should be double, and open near the top of the vault, or it may have no door on the side, and be filled and emptied through a trap door from the upper story. The lower floor must be high enough to draw water from it into the milk vat.

4. General store room and wood cellar, 11 by 18

5. A stove or furnace of some kind, at which steam is generated for warming milk, heating water, &c. 6. Stairs to the cheese loft. 7. A tin cistern, large enough to contain as much milk as is to be set at once, surrounded by a wooden vat, leaving a space an inch wide at the sides, and nearly two under the bottom, for the introduction of water, either warm or cold, for heating or cooling milk. *a.* Lead pipe leading from steam generator to water in wooden vat, by which the milk is conveniently raised to any desired temperature. By means of the stops in the pipe, the steam may be let in to a water cistern (12) when not needed to heat the milk, by which hot water is always easily kept on hand for cleansing the various utensils. The end of the steam pipe should pass under the center of the cistern, and a board a foot square must be placed between it and the cistern to prevent heating the cistern too hot just when the steam is discharged. *b.* A pipe leading to the sink drain, by which both the whey and water are led off from the cistern, when the cheese is sufficiently scalded. The whey pipe should be large, not less than two inches, so that when the orifice is opened the whey will escape immediately and thus prevent the curd from sticking together. To prevent the curd from escaping with the whey, a tin strainer of a peculiar form is inserted in the orifice. This strainer is a cylinder five inches in diameter, and as long as the vat is deep; this cylinder is perforated as full of fine holes as the strength of the metal will admit, and to the lower end of it is soldered a tin tube large enough to fit the orifice in the bottom of the vat. While the curd is setting, the orifice is stopped with a plug reaching the top of the vat, smaller at the upper end, and when the whey is to be let off, the tin strainer is slipped over the plug, and into the orifice, when the plug is removed, and the whey escapes; this may be done if the orifice is tapering, and the plug made to fit the lower part, and the cylinder the upper. *c.* Pipe leading cold water from the bottom of the ice house to the wooden cistern, for the purpose of cooling the milk.

8. Cheese press. 9. Table for turning the cheese upon. This table should be about two inches lower than the press bed, and a wide board, upon small wheels, is placed upon the table, and the cheese placed upon it, after being pressed.

10. An elevator raised by cords, pullies, and weights, by which the cheese is elevated on the little car, to the loft, when, after being wheeled on the scales and weighed, it is run back, raised to any shelf, and wheeled around to any desired place. This saves all lifting, after leaving the press, till it is sold. 11. Pump or penstock. 12. Tub or cistern for heating water in, by steam. 13. Wooden vat in which the tin vat is placed. 14. Sink provided with a spout, leading all slop, whey, &c., away. 15. Doors. E. Windows.



SECOND FLOOR.

Plan of loft.—A. Second floor. B. Shelves, 30 inches wide, extending around the room. As many of them can be arranged as necessary to accommodate the cheese.

There is but one window, and this should be provided with blinds and darkened in warm weather, to guard against all insects. 16. Scales.

In all the operations of the dairy the most scrupulous cleanliness must be observed; but in the production of butter it is even more necessary than in cheese making. Cream is more easily tainted by noxious gases than almost any other substance. It is impossible to make good flavored butter if the utensils and dairy are not scrupulously sweet; or if fumes from the barn-yard or out-buildings are not excluded.

As we have said, the oil or butter is suspended in milk in small globules surrounded by films of casein. Cream is an aggregation of these oil bags. The object of churning is to separate the oil from the curd by which it is surrounded. This is accomplished by agitating the cream and breaking the films of curd, setting the oil free, which then runs together and forms lumps of butter. Cream, from the formation of lactic acid, is generally sour before churning, and if not, always becomes so during the operation. The lactic acid acts on the films of curd and renders them more easily broken. During the progress, the cream increases in temperature from 5° to 10°. The best temperature at which to churn the cream is a disputed point. It appears, however, to be well established by numerous experiments, that 55° Fahr. when the cream is put in the churn, and about 65° when the butter comes, affords the best results. If higher than this, the butter is white and soft; if lower, the whole of the butter is not separated and the labor of churning is much increased. In summer, the

butter should not come in less than 40 minutes. If obtained quicker it is generally at the expense of color, flavor, and hardness. After the cream is broke, it should be churned slowly till the butter is gathered.

Some good butter makers do not wash the butter at all, merely working out the buttermilk by pressure. It is said that a better flavored butter is obtained in this way; but where good, cool spring water can be obtained we prefer to thoroughly wash the butter, taking great pains to remove all the buttermilk. Butter generally contains about 15 per cent. of water, curd, &c. It is important for the preservation of butter that as much of this as possible should be removed. The quantity of salt required depends very much upon the quantity of water in the butter. The water should be saturated with salt, hence the less water the butter contains, the less salt will be required for its perfect preservation. There are several machines for working butter, but we have had no experience in their use.

There are various opinions as to the advantage of churning the whole milk or only the cream. Some contend that not only is more butter obtained by churning the whole milk, but that it is of better flavor. There is probably a little more butter obtained but that it is of better quality we may be allowed to question. In the neighborhood of a large city, where, as in Great Britain, buttermilk is in demand, it will pay to churn the whole of the milk, but as a general thing, it is much less labor and far more convenient to churn only the cream.

In some of the best English dairies that we are acquainted with, the milk is skimmed every morning; and sometimes, when a very superior article of butter is required, the cream from the first or second skimmings only is churned—that from the milk when it is partially or quite sour being churned separately for use in the kitchen. In this country, the milk is not skimmed till all the cream has risen, and it is all removed at once. This is probably the better way, for not only is it less labor, but the milk remains sweet much longer than when disturbed every morning by skimming; and this in our hot weather is quite a consideration. It is desirable that the dairy should be cool enough to keep the milk sweet sufficiently long to permit all the cream to rise to the surface, for there can be little doubt that if the milk becomes quite sour or bitter before the cream is removed, the quality of the butter will be impaired. Milk, too, for butter making purposes should not be placed in deep pans, or all the cream may not have time to reach the surface. For the same reason the pans should be narrower at the bottom than at the top.

Probably a better quality of butter is obtained by churning the cream before it becomes sour. In hot weather, it is almost impossible to do this, without churning every morning. A greater length of time is occupied in churning sweet than sour cream, but in hot weather this is no objection. When by fast churning, or any other cause, the butter comes in 10 or 15 minutes, it can hardly fail to be soft, white and poor flavored. A celebrated butter maker in this state, who churns every morning in hot weather, has the cream so cold, and churns so slowly, that the butter is from one to two hours in coming. When the butter is come, it is well washed and salted—6 lbs. Pacific salt to each 100 lbs. of butter. The next day it is re-worked till every particle of buttermilk is removed, when it is packed in tubs, and stored away in a cool cellar.

"The chief points besides cleanliness," says an experienced writer, "in making good butter are these: To milk at regular hours; to place the milk in shallow vessels; to have a perfectly clean cellar, with a hard brick or flag stone bottom, and with shutters and wire screen windows, to admit air and exclude insects; to skim the milk the moment it coagulates or "lobbers," which will be in 30 to 48 hours; to churn the cream at a temperature between 60° and 65° [in hot weather 55° to 60° is better] by the thermometer; to free the butter as much as possible from buttermilk, and then add a sixteenth part of the purest salt; to work out the remaining buttermilk in 12 hours afterwards, and again in 24 hours, being careful not to work it too much at a time; to pack it closely in stone jars, till nearly full, and then spread clean white muslin cloth over the top, pack closely a layer of one inch of fine salt upon the muslin, and finally cover the jar with a neatly fitting tin cover. This is, substantially, the process of most of the best butter makers. Butter thus made will keep a year, if placed on the bottom of a cool cellar."

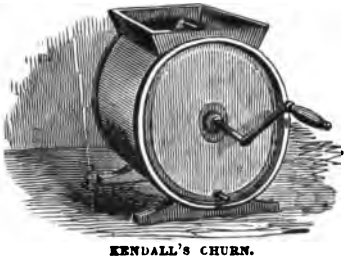
Cream always becomes sour in churning, and rises in temperature. This is owing to chemical action—to the conversion of sugar into lactic acid. This increase in temperature, if the cream is cool enough when put into the churn, is probably desirable. But after the cream is well "broke," it is frequently necessary to cool it slightly, while the butter is being gathered. This is usually done by pouring in a little cold water, washing down the particles of butter attached to the sides of the churn at the same time. In gathering the butter, it is essential not only to have the buttermilk cool, but to churn quite slowly, or the butter will be soft, and it will be difficult to work out the buttermilk.

For the attainment of the proper temperature in churning, we consider the "Thermometer Churn" one of the best inventions of recent date. It consists of a zinc cylinder, with the lower half encased in a wooden frame lined with zinc, having an inch or two of space between, so that the body of the churn can be surrounded with warm or cold water as desired. There is also a thermometer set in one end, which is of much use as long as it is clean, so that the mercury can be seen.

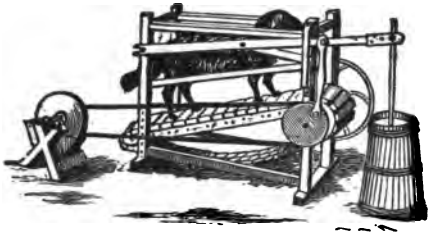
THERMOMETER CHURN.

Kendall's Cylinder Churn is well known, and much esteemed for its cheapness and simplicity. It is an excellent churn, especially for small dairies. Some object to it and to the Thermometer Churn, on account of the corrodibility of the iron at the ends of the axis, which, when much time is occupied in churning, as is frequently the case in late autumn and winter, imparts by the action of the acid buttermilk

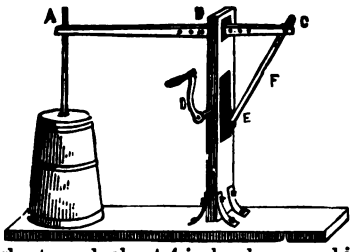
a disagreeable color and flavor to the butter. This difficulty does exist in all churns of this description we have used. Nevertheless, if the joints are properly fitted together, and ordinary care is exercised in keeping them clean and free from all rust, little inconvenience will be encountered from this cause. There are those however, who prefer the old barrel churn, or some of its modifications, as in it all danger in this respect is removed. Some, too, are inclined to go back to first principles and use the old up and down plunge churn. This is very well where a dog power is used as shown in the annexed engraving; but when worked by hand, it is a barbarous institution, at least such was our opinion when in our boyish days we had to use it by the hour together.



KENDALL'S CHURN.



If a dog power is not used, the labor of working the plunge or dasher churn may be greatly lessened by means of a crank. Numerous methods for accomplishing this are employed, but there are probably none more simple than that given by E M. FULLER. Salisbury, N. Y., in the *Country Gentleman*, as shown in the accompanying cut.



A, is the mortice that the dasher goes through—B, is the place where the evener is fastened, by means of a bolt; and by moving the evener towards the letter B, the dasher will not move so high—C, is the place where the evener and pitman are joined—F, is the pitman—D, is a crank about a foot long—E, is a short crank about 4 inches long, working in a mortice in the center of the post, 1 foot long and 4 inches wide. A fly wheel attached to this or similar contrivances would be a great advantage in lessening the labor, by rendering the motion uniform.

By whatever means cream or milk is churned, the motion at first should be rather slow, increasing when the cream begins to swell. Sometimes the cream will swell so much that very rapid motion is required, but when it begins to sink, the motion should be lessened somewhat, and after the cream is "broken" it should be gradually slower till the butter is gathered into lumps.

We cannot better close this article than by copying from the *Country Gentleman*, a description of a dairy room belonging to HARVEY WING, Morris, N. Y., combining in an unusual degree the necessary requisites for successful butter making.

The room, (on the north side of the house) is sixteen feet long by ten feet wide, and is situated directly over a cold cellar, from which the air may be drawn at pleasure by means of ventilators, for the perfect regulation of the temperature of the room. The places of these ventilators, (between the room and the cellar,) are shown in the plan Fig. 1., by the dotted lines on each side of the room, and they consist each of a single slit or opening, under the shelves, running the whole length of the room, and closed by a board with hinges precisely like a trap door. These slits are only six inches wide; it is believed that more perfect ventilation would be afforded, and a more complete control of the temperature attained, if they were nine inches or a foot wide.

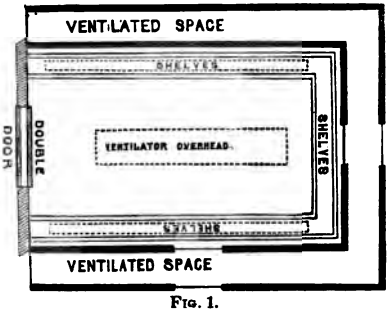


FIG. 1.

Overhead, there is another ventilator, also closed by a similar trap door, 6 or 7 feet long and a foot wide, opening upwards. An elevating stick with holes or notches, enables the attendant to raise them to any desired degree. When the upper ventilator is opened, the heated air of the room passes out by reason of its specific levity, and the cold air from the cellar, immediately rises to supply the space,—in the same way that water rises to fill a pump when the air is drawn out above.

A ventilated space of one or two feet surrounds the room, and prevents the heating so often resulting from confined air in the adjacent walls. This ventilation is only partially effected in the instance before us, a temporary board partition being made to form the outer wall on the exterior side of the room—we have consequently figured in one plan, what it is *intended* to be in this respect, rather than what we found it in actual practice.

The room is entered by a double door, the outer being a tight one to exclude hot summer air, and the inner of lattice or wire-gauze. to admit cool night air when necessary.

The shelves are not flat boards, as usually constructed, but are formed of two narrow strips of inch board on edge, on which the pans rest, thus admitting a free circulation of air on every side. The mode of constructing these shelves is shown in figs. 2 and 3. Fig. 2 exhibits the upright board support at the ends of the shelves and at intervals of five feet between; the notches

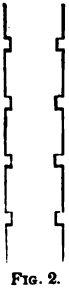


FIG. 2.

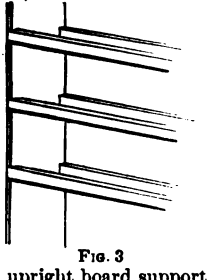


FIG. 3

being made on each side to receive the horizontal strips which form the shelves. Fig. 3 shows a portion of the shelves completed. A space is left between them for the side window. The strips forming the shelves are 9 inches apart outside for each, and each strip 1 by 2 inches, set on edge. The shelves are 8 inches apart, or with 6 inches of clear space between them, for the reception of the pans.

It is found of great importance not to fill the pans to more than one-half their capacity—one-third is still better. The dairy, consisting of about 15 cows, requires nearly 200 twelve-quart pans at the season when milk is most abundant, the rising of the cream continuing longer than is common, on account of the perfect control of temperature which is secured by the ventilation of the room. There are 11 shelves, on 3 sides, with the exception of a space for windows, and they are capable of holding 250 pans if required

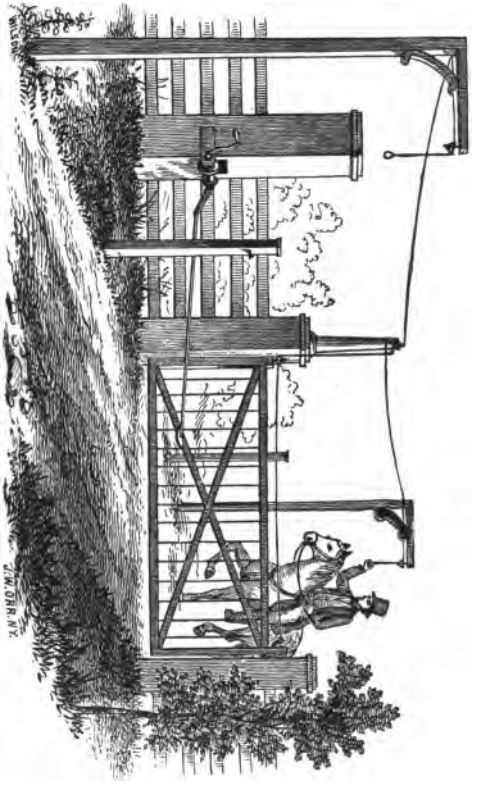
WINEGAR'S AUTOMATON GATE.

Equestrians and carriage-drivers have long felt it quite an annoying inconvenience, to be compelled to alight whenever passing a gate. The rich man's remedy is a porter's lodge, and a person hired by the year to open and shut the gate on the approach of any vehicle. But all this trouble may be easily and cheaply avoided by the use of *Winegar's Automaton Gate*, invented by C. WINEGAR, Esq., of Union Springs, N. Y., the successful operation of which we have had ample opportunity of witnessing.

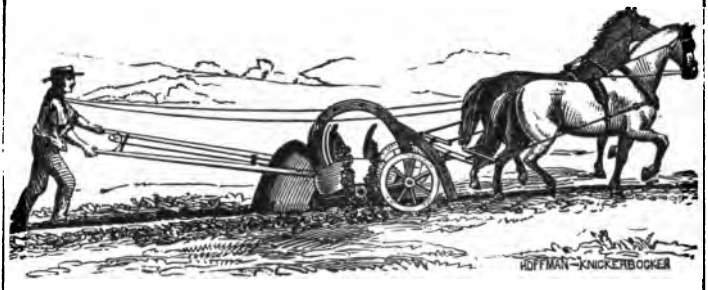
This contrivance, not unlike a clock, consists of two principal parts, the running and regulating parts. The weight which opens and shuts the gate, is contained in a tall box, seen on the left side of the figure, and resembling in external appearance a large post. The weight, in descending, turns a crank. A rod placed between this crank and the gate, and connected to each, receives by this means a reciprocating motion, and would open and shut the gate in rapid succession until the weight reaches the ground, were its motion not controlled by the latch which fastens it shut when it strikes the post, or which fastens it open as soon as it reaches the smaller post placed at the proper point for this purpose.

The opening and shutting is effected from the carriage or saddle by simply giving a slight pull or jerk on the loop suspended from the arm of the tall post, a short distance from the gate. A wire, extending from this loop to the hinge-post, and thence across the top of the gate to the latch, instantly sets it free whenever a slight pull is given, and the crank and rod immediately draw it open, where it is retained by the latch. On passing through, the loop is pulled on the other side, loosening the latch again, and causing the gate immediately to close.

The weight, when once wound up, will open and shut the gate about fifty times, and a boy ten years old will easily do it in a few seconds. In ordinary cases this will do if performed once a week, or if the gate be much used, it may be done each morning with the rest of the "chores." We consider it an important invention, and an admirable contrivance. The whole cost is $10 to $20.



WINEGAR'S AUTOMATON GATE.



PRATT'S DITCH DIGGER.

Nearly every important operation in modern improved farming, may now, through the improvements in machinery, be performed by horse power. The spade has given way to the subsoil and trench plow, the hand rake to the horse rake, the flail to the thrashing machine, hand sowing to the wheat drill, the scythe and cradle to the mower and reaper, and lastly, and by no means the least, an efficient ditch digging machine has been made and put into successful operation, that will work in almost any soil. The inventor is R. C. PRATT, and the manufacturers are PRATT & BROTHERS, of Canandaigua, N. Y.

We have tried this machine on our own land, and seen it operate in other places. A furrow is first turned with the common plow, and the ditcher then passes and repasses, throwing out from one to three inches of earth at each passage. In dry peaty ground, it will throw out five inches. It will cut 9 inches to a foot wide, and fully two feet and a half deep—it may be made to run down three feet. A small plow attached to the machine loosens the earth, and revolving shovels throw it out. Where there are no stones, one man with a team will cut 75 to 100 rods of ditch two and a half feet deep in a day. Where stones prevail, an additional hand or two are needed to loosen them with a crow bar, and throw them out as they are successively laid bare, and these will also reduce the daily amount of work to 50 or even down to 30 rods. This estimate is the result of our own experience and observation; and we are satisfied that the cost of digging ditches will be reduced to less than one half the present expense, by the use of PRATT'S DITCHER.

This machine is nearly all iron, is strong and well made, not liable to get out of order, so far as we have observed, and is sold at what we regard as a low price for the cost of manufacture, namely $150.

RICHNESS OF MILK.—An experienced farmer says, "I find by churning the milk separate, that *one* of my best cows will make as much butter as *three* of my poorest cows, giving the same quantity of milk."

FEEDING CATTLE.—Cattle standing in cold muddy yards, exposed to the weather, consume about twice as much as those in sheltered stables kept clean and littered, and free from the accumulations of manure.

ALLEN'S MOWING MACHINE.

Since the publication of the Register for 1855, which noticed several of the principal mowing machines then in use, another has been brought before the public, which has been proved of great efficiency and value. This is *Allen's Mower*, as improved and now manufactured by R. L. ALLEN, of New-York. Having witnessed its operation, and received information from several intelligent farmers who have given it a thorough trial, we are satisfied that taken all together it has no superior, and in some respects it excels any other machine that we have examined.

FIG. 1.

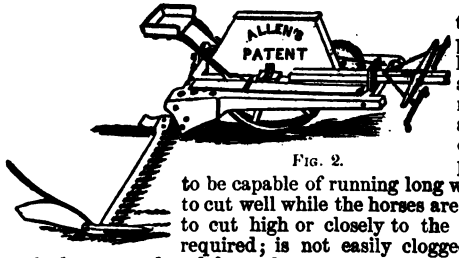


FIG. 2.

Among those advantages which this mower particularly possesses, lightness, ease of draft, and efficiency on both rough and smooth land, appear to be conspicuous. As recently improved, it appears also to be capable of running long without needing repairs; to cut well while the horses are moving at a slow pace; to cut high or closely to the ground, as may be required; is not easily clogged; and may be easily backed, or transferred from place to place.

Fig. 1 represents the mower with the cover off, to show the gearing; and Fig. 2 the same with the cover on. The driver in riding, places one foot on each side of this cover, and is thus firmly secured in his seat, however rough the ground may be.

The price of this mower is $120, or with mower and reaper, $140.

HORTICULTURAL HINTS.—To preserve plum trees from black knots or excrescences, cut them off several times a year, *cut* and *keep cutting*.

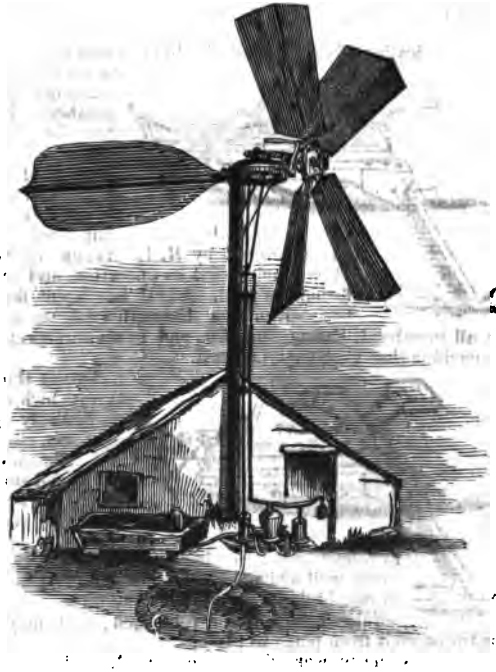
To prevent the cherry crop from being spoiled by the curculio, *keep the ground from grass.*

The only remedy for the cherry bird, is shooting—hundreds have thus been driven away by a few hours labor, *so that one was not seen for a week.*

The best remedy for bugs on melons and squashes, is a cheap square box, covered with gauze or netting.

To transplant evergreens, one point attended to will result in success—neglected, in failure—this is, *removing plenty of the earth with the roots.*

Mulching and watering the raspberry on light soils, will usually double the size of the fruit.



HALLADAY'S WIND-MILL.

Steam, horse, and water-power, have been variously used for driving stationary machinery. The two former require the expenditure of fuel or feed, and the latter does not exist on many farms, and can be only occasionally used. But there is another, and universal power—found on every part of every single farm in the world—and sweeping over all with a strength of thousands of horses—which has been very little used for farm purposes. This is wind.

The great difficulty in the way of the general use of wind-power, is its unsteadiness. Common wind-mills of much size cannot be run in any weather of a tempestuous character, and much care is needed in regulating; rendering its ordinary use impracticable. Small wind-mills, not over four feet in diameter, have been successfully applied to the pumping of water, where the wells were not deep; but unless well made, even these are liable to be broken by strong blasts.

These difficulties have been very successfully overcome by Halladay's Self-Regulating windmill, invented by DANIEL HALLADAY, of Ellington, and manufactured by the Halladay Windmill Company, of South

Coventry, Ct. The self-regulating part is not unlike that of the *governor* of a steam engine. When a strong wind drives the mill too fast, the excess of water driven by a forcing pump against a piston, is made by a set of rods and levers to turn the edges of the sails more against the wind, and when the wind subsides, the same cause restores them to their former position.

These windmills are chiefly intended for farmers, and may be applied to various other purposes besides pumping water. It is now about two years since their manufacture was commenced, and we have heard of none out of the many which have been erected, that have been blown down or injured by the wind. The cost of the smaller size is $75.

SCOTT'S CORN AND COB-MILL.

For grinding corn in the cob, and other coarse feed, for domestic animals, and saving the toll and drawing to mill, by the use of horses on rainy or spare days, probably nothing equals SCOTT'S CORN AND COB MILL, manufactured by R. SCOTT & Co., of Philadelphia, and others. It is strong; weighs only three to five hundred pounds; costs from $44 to $66, varying with size, and with one or two horses will grind into coarse meal from eight to twenty bushels of corn per hour. Several thousands of these mills have been sold, and so far as we know, have given satisfaction — some asserting that they have paid for themselves in a single month.

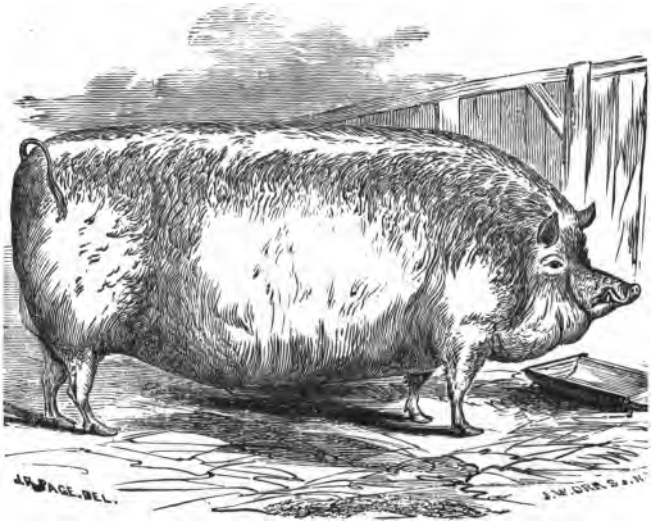
STEALING FROM GARDENS.—The author of "Rural Hours," after speaking of some well dressed girls, "elegantly flounced," &c., reaching their hands through the garden fence, and helping themselves to some of the finest and rarest flowers, just as if they had a right to them, asks the very pertinent question, "What would they have thought if some one had stepped up with a pair of scissors, and cut half a yard from the ribbon on their hats, merely because it was pretty, and one had a fancy to it?" Yet the flowers cost more time, labor, and money, and could not be so easily replaced.

UNITED STATES STANDARD BUSHEL.—This contains 2150.42 cubic inches. Its dimensions are 18½ inches (inside) diameter, and 8 inches deep, and when heaped the cone must be at least 6 inches high.

SHORT-HORN COW JACINTHA.

IMPROVED ANIMALS.

We gave portraits in last year's REGISTER, illustrating some of the best breeds of animals, with the hope that they might prove useful to farmers in selecting good blood to infuse into their herds by crossing with natives. We now furnish engravings of some single individuals of recent importation or raising, in further illustration of the character of these breeds.

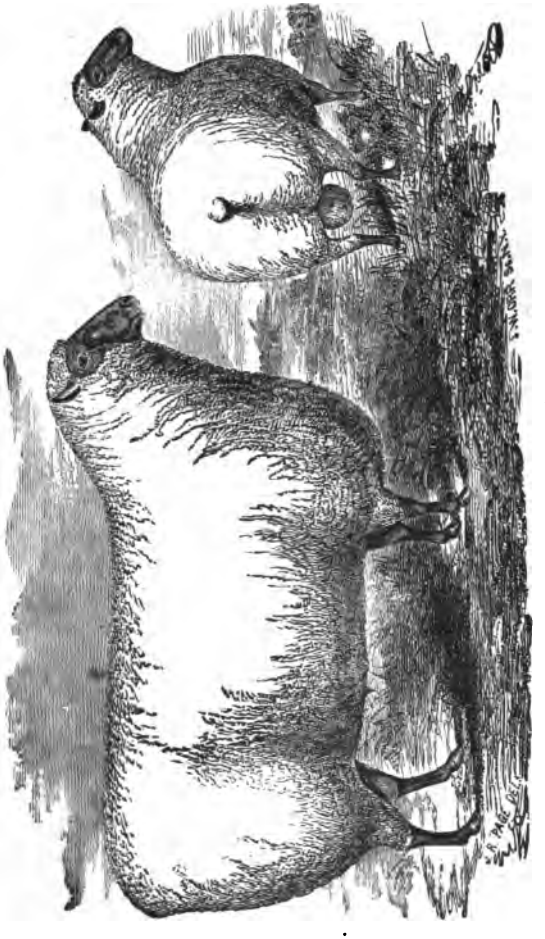


SUFFOLK.

The above is a portrait of a fine animal of the Suffolk breed, belonging to LEWIS G. MORRIS, of Mount Fordham, near New-York. It won one of the first prizes at the New-York State Show in 1853.

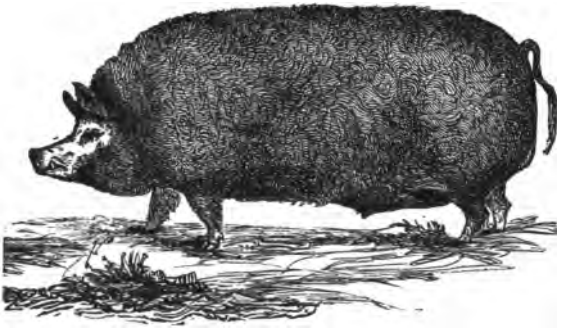
The Suffolk is an admirable breed for crossing with the larger and more hardy animals among our native swine, and is deservedly more popular than any other improved breed for this purpose.

A correspondent of the *Country Gentleman*, speaking of the Suffolks, says:—"In all the good qualities that constitute a perfect animal for producing the most pork, of the best quality, at the least cost, this family stands unrivalled as yet by any in the United States. Their merit in part consists in size, length of quarters, short and lean dished heads; fine, thin, and upright ears; prominent eyes; fine tail, and limbs; quietness; and, above all, their perfect adaptation to take fat readily on the most valuable parts. I have slaughtered hogs of this breed whose live and dressed weights differed less than a ninth." The introduction of these animals



SOUTH-DOWN.

into the State is a matter in which our farmers are much interested; and all who can should avail themselves of the benefit to be derived from them.



BERKSHIRE.

Scarcely inferior in any particular to the Suffolk, is the improved BERKSHIRE, although it is disliked for its usual black color. The above figure represents one of L. G. MORRIS' finest boars of this breed.

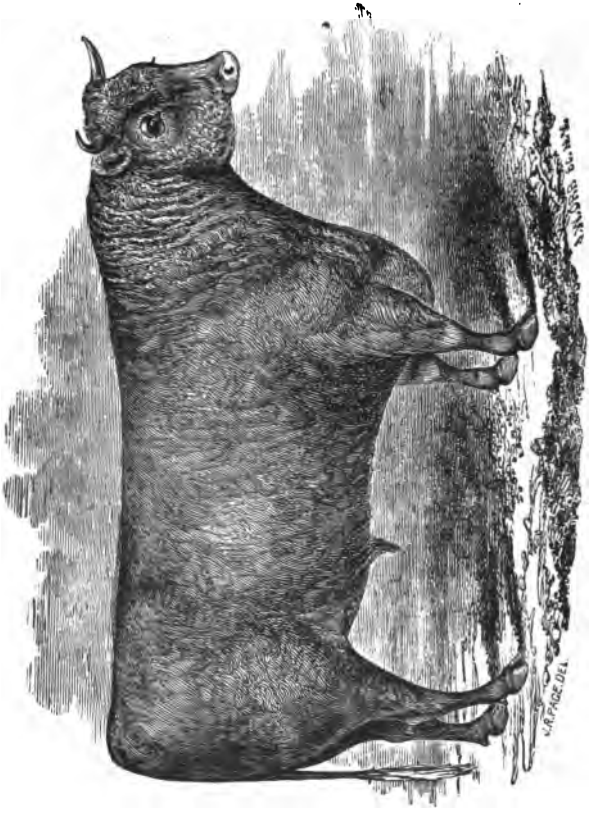
SOUTH DOWN SHEEP.

Beautiful South Down Sheep, from the celebrated herd of JONAS WEBB in England, have been imported by JONATHAN THORNE of Dutchess county, and L. G. MORRIS of Fordham, N. Y., and so perfect are these animals of their kind, that before importation, was several hundred dollars each were paid to obtain them. The excellent portraits which we give, hardly do justice to their full and symmetrical form. (For illustration, see page 262.)

IMPROVED CATTLE.

The two favorite breeds of cattle, with most of our enterprising farmers, are the Short Horns and Devons. In many districts of country, a great and striking improvement has been effected in the common herds by crosses with the Short Horns; and the rapid introduction of the Devons is likely to result in a similar advantage; the former increasing the size, early maturity, and fullness and symmetry of form—and the latter, the compactness, finish, hardiness, and beautiful exterior—of our native animals.

The accompanying portraits represent excellent specimens of each of these breeds, imported by L. G. MORRIS, of Fordham. (For illustrations, see pages 260 and 264.)



DEVON BULL

DOMESTIC ECONOMY.

WASHING FLANNEL. To prevent flannel from shrinking and turning yellow, wash them in hot suds, and rinse them in clear, soft, boiling water —standing till cool enough to wring out.

INK SPOTS may be removed from linen by dropping melted tallow on them, and then washing.

A GOOD RAT TRAP may be made by filling a smooth kettle to within six inches of the top with water, and covering the surface with chaff. The first chap who gets in makes an outcry because he cannot get out, and the rest coming to see what the matter is, share his fate.

TO REMOVE OLD PUTTY, moisten it with muriatic acid, and it will immediately become soft.

TO WASH SILK WITH GREAT SUCCESS, spread it on a table, and then rub it with a sponge dipped in a mixture of equal parts of soft soap, brandy, and cane molasses. Rinse it thoroughly in three successive portions of water, and iron it before quite dry.

WOUNDS IN CATTLE are quickly cured by washing several times a day with a mixture of the yolk of eggs and spirits of turpentine.

PAINTING HOUSES. The paint will harden better and last twice as long by being applied late in autumn, than during the hot season.

MARBLE FIREPLACES AND TABLES. Never wash them with soap suds —the potash of the soap decomposes the carbonate of lime, and in time destroys the polish.

DOOR KNOBS. To secure the paint around them in cleaning, place a piece of pasteboard with a hole cut to encircle them, and a slit to slip on.

GRIDDLE CAKES. To prevent them from sticking, rub salt over the griddle with a piece of bread before greasing.

MOTHS are effectually excluded from clothes kept in cedar chests, or with cedar shingles occasionally laid between the clothes, in wardrobes, closets, &c.

FLAT IRONS, if rough or smoky, will not stick to a starched surface, if rubbed over a flat surface of salt laid on a board or table.

CRACKS IN STOVES may be effectually stopped by a paste made of ashes and salt, with water. Iron filings and sal ammoniac make a still harder and firmer cement.

GILT FRAMES, if cleaned are soon worn and spoiled—to prevent which, preserve them by applying a transparent varnish.

TO DRY PUMPKINS, stew them first—they will be as good as fresh pumpkins in winter. Finish the drying in a warm oven.

TO PREVENT COLORS FADING. Dip new calico, pocket-handkerchiefs, &c., in salt water.

BEE STINGS may be quickly cured by applying repeatedly a soft paste made of saleratus and water—the potash neutralizes the acid poison.

A GLASS STOPPER, when too tight to be easily removed, may be easily loosened by applying a cloth wet in hot water, which expands the neck and sets it free.

ADHESIVE PASTE, made of rye flour, with a little alum added while it is boiling, is almost as strong as glue.

CARPETS last longest by being often shaken, preventing the dirt under and in them from grinding out the texture; and by not being swept too frequently

MINCE PIE MEAT will keep well for several months, boiled, chopped, and packed down in a stone jar covered with molasses.

SAUSAGE MEAT is best preserved in new cotton bags a foot long and two or three inches in diameter, which after filling are dipped in and coated with melted lard. When used, the bag is sliced off with the meat, as it is much easier to make new ones than to preserve the old.

WEEKLY EXAMINATIONS. See that beef and pork are under brine; count towels, sheets, spoons, &c.; examine preserves and see they do not become mouldy; mend all garments; see that vegetables in the cellar are not sprouting and becoming mouldy; count clothes-pins; stir Indian meal to prevent fermentation.

FRAGMENTS OF BREAD may be all saved by making them into toast and puddings, and they also make excellent pancakes, by soaking over night in milk, and then adding an egg or two and a little salt and flour.

PRESERVES. If fermenting, boil them, and add a little powdered saleratus, say size of a pea for a quart or two, but more if much fermented.

BLACK ANTS. A correspondent of the *Country Gentleman*, says he tried many remedies for black ants without any success. His ground being gravelly, he could not make holes with the crowbar to entrap them; tin cylinders, sunk in the earth, containing molasses, they went into—helping themselves with the molasses, and crawling out again. Tar round his trees became crusted in one day, and they crawled over it. They seemed to care nothing for all his attempts to get rid of them. He at length presented them a *bill* for *collection*, for damages done, and that answered completely. Chickens completely routed them,—the coops being placed about the garden walks. In one week, the last ant disappeared.

TO MAKE HEMLOCK BEER FOR THE SICK. Fill a very clean two gallon iron kettle with hemlock branches and with cold water, and add two quarts of wheat bran; boil nearly an hour, strain and sweeten it with nearly a pound of sugar, add a teacup full of fresh yeast. As soon as fermentation commences, bottle it for future use. Tried, and found right.

CHURNING. In churning butter, if small granules of butter appear which do not "gather," throw in a lump of butter, and it will form a nucleus, and the butter will "come."

TO REMOVE RUST FROM KNIVES, &c. Cover the knives with sweet oil, well rubbed on, and after two days, take a lump of fresh lime, and rub till all the rust disappears. It forms a sort of soap with the oil, which carries off all the rust.

TO CLEAN BRASS. Rub the tarnished or rusted brass, by means of a cloth or sponge, with diluted acid, such as the sulphuric, or even with strong vinegar. Afterwards wash it with hot water, to remove the acid, and finish with dry whiting.

GLOSS ON LINEN. To restore the gloss commonly observed on newly purchased collars and shirt bosoms, add a spoonful of gum-arabic water to a pint of the starch as usually made for this purpose. Two ounces of clear gum-arabic may be dissolved in a pint of water, and after standing over night, may be racked off, and kept in a bottle ready for use.

TO THAW FROZEN PUMPS. Some throw in salt, some heat iron rods, &c., but an incomparably better way is to place a small lead pipe within the pump, and pour in hot water by means of a funnnel. The pipe should be as long as the frozen portion; and conducting the boiling water right on the ice, removes it with astonishing rapidity, say one foot per minute,

the pipe settling as rapidly. Where pumps are liable to freeze, it is well to have a lead pipe always at hand.

OILING LATCHES AND HINGES. Every person who lives in a house, should spend fifteen minutes once every month in going over every part with a teaspoonful of oil and a feather, and give all the hinges, locks and latches a touch. It will save an incredible amount of scraping, banging, jarring, squeaking, harsh grating, dismal creaking, and other divers and several noises, which result from the want of a little oil.

INTERESTING FACTS FOR FARMERS.

THE WAY WEEDS MULTIPLY. Dr. Lindley estimates as a low average the following number of seeds from each of these four plants:

1 plant of	Groundsel	produces.....	2,080	16,360 plants,
1 "	Dandelion	"	2,740	
1 "	Sow Thistle,	"	11,040	
1 "	Spurge	"	540	

or enough seed from these four plants to cover three acres and a half, at three feet apart. To hoe this land, he says, will cost 6s. (sterling) per acre, and hence a man throws away 5s. 3d. a time, as often as he neglects to bend his back to pull up a young weed before it begins to fulfil the first law of nature. He recommends every gardener, whose vertebral column will not bend, to count the number of dandelions, sow thistles, &c., on the first square rod he can measure off. This same operation may be repeated in this country, by applying all the above estimates to the pig-weed, burdock, mullein, fox-tail, chick-weed and purslane.

PLOWING HEAD-LANDS. We observe that this is often inconveniently and awkwardly done. The best way is to leave strips of untouched land at the sides, as well as at the ends of the field, all of equal width, and then the whole is finished by going round with one continuous furrow until it is finished close to the fence. In this way none of the newly plowed ground is trodden hard.

STRIKING ILLUSTRATION. At the Agricultural Convention held in Boston in March last, the presiding officer, Hon. M. P. WILDER, in the course of an able speech showing the advantage of improving agriculture, gave the following example:—"We have 150,000 cows in this Commonwealth. Suppose science enable these, or improved breeds, to yield *one* additional quart of milk per day, this at 3 cts. per quart, would increase the productive capital of the State $4,500 per day, or $1,642,500 per year; or if two quarts per day, a gain of more than *three million dollars* annually.

DURABILITY OF RED CEDAR. We have heard of an old farmer, who, when asked how he knew that cedar posts would "last forever," said he had frequently tried the experiment. Some may doubt his assertion, yet its lasting powers have been found to exceed a long lifetime. At the head of one of the graves in "Old St. Mary's," Md., there stands a cedar slab, which, as the inscription indicates, was placed there in 1717, and is still perfectly sound.

BREAKING HALTERS. It is a serious fault for a horse to pull at his halter. An animal of this character was tied to a stake on the bank of a stream, with his tail towards the water. He snapped the halter, tumbled

over the bank, floundered in the water to his heart's content, and afterwards was willing to remain "*at his post.*"

AGRICULTURAL PAPERS. Every farmer, however small his farm, can well afford to take a good agricultural paper, to assist him in the erection of suitable buildings and fences; the making and saving manure; the selection of proper agricultural implements; the best kinds of stock and fruit; the feeding and fattening of cattle; the management of his land and crops; thus obtaining the united wisdom and experience of science and the best practical farmers, not only of our own country, but of the civilized world.

DEEP AND SHALLOW PLANTING. C. L. SHEPHERD, of Illinois, planted his corn-field shallow, or about an inch deep, except eight rows through the middle, which were planted two or three inches deep. The shallow corn came up first, and kept the lead during the whole season. The difference was discernible as far as the corn could be seen.

WASH FOR BARNS. The *Horticulturist* gives the following as the best for this purpose: Hydraulic cement, 1 peck; freshly slacked lime, 1 peck; yellow ochre, (in powder,) 4 lbs.; burnt umber, 4 lbs.; the whole to be "dissolved" in hot water, and applied with a brush.

BENEFIT OF DEEP PLOWING. The *Michigan Farmer* states that H. B. LATHROP, of Jackson county, in that State, put in a piece of wheat, plowing not less than eight inches deep. At the same time, a neighbor plowed an adjoining field, being careful that the plow did not run more than four inches deep. The deep plowing gave *thirty-two* bushels to the acre, and the shallow plowing only *seven*. A portion of the sub-soil often operates as manure, and a deep soil prevents excessive flooding, as well as excessive drouth. The result, however, may vary much with change in localities, but may be easily determined by experiment.

DURABILITY OF POSTS. In a recent discussion, one member said he had used burr-oak posts 7 years, and thought they would last 6 or 7 years longer. White-oak will last, according to another member, 10 or 12 years; locust 20 years or more. Another stated that cherry rotted in 8 or 9 years; white-oak in 10 to 14 years; black-walnut in 9 to 10 years; locust 20 years. Much depends, it was affirmed, on the character of the soil; moist land causing a sooner decay than dry.

HEDGES FOR FLOODED LANDS. M. B. BATEHAM, of the *Ohio Cultivator*, states that a two year old osage orange hedge was submerged a week without injury, where peach trees were killed by the flooding.

PARSNIPS FOR HOGS. Parsnips appear to be nearly the only root, good for swine in an uncooked state. Turn a herd of swine into a field containing field beets, ruta bagas, carrots, and parnips, and the question will very soon be settled which they like best, and which, consequently, is best for them—the parsnips being wholly devoured before the others are touched.

BALKY HORSES. It is said to be a first rate way to treat balky horses, by hitching a good steady horse and team behind them. They will soon forget their peculiar propensities and be glad for a chance to move the other way.

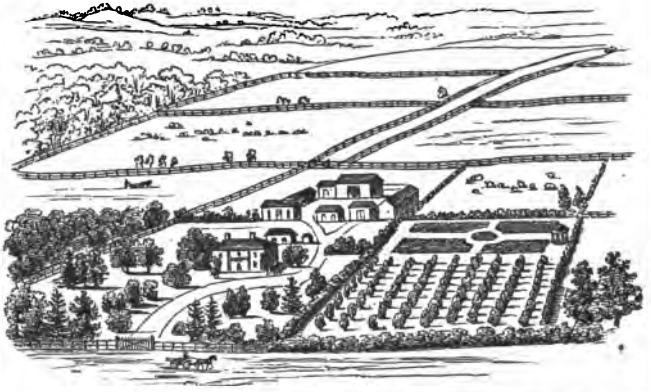
FOOD FOR SICK ANIMALS. The American Vet. Journal states that an excellent diet for sick animals, is simply *scalded shorts*. When a horse has taken cold, with discharge from the nostrils, the *mash* may be put into the manger while hot, with a view of steaming the nasal passages.

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.



LAYING OUT AND DIVIDING FARMS.

ONE of the most important parts of farm management, consists in the convenient and economical subdivision of farms into fields. It is the very foundation of systematic culture. A good rotation, and a profitable application of labor, cannot exist in badly arranged and inaccessible lots. The following may be given as some of the most prominent points to be observed in planning subdivisions:

1. Fields to be of nearly equal size, so as to admit a rotation of crops.
2. A suitable number of fields, to allow the various crops to occupy each its own field.
3. The form to be nearly square, to save fencing material, unless the land varies in character.
4. Where the land varies much, a variation in boundaries so as to bring the same kind of soil into the same field, more especially if swamp and upland.
5. Placing the lane or farm road, so as to enter all the fields by as short a way as practicable.

6. On a hilly or uneven surface, varying the farm road so as to keep it as nearly level as may be.

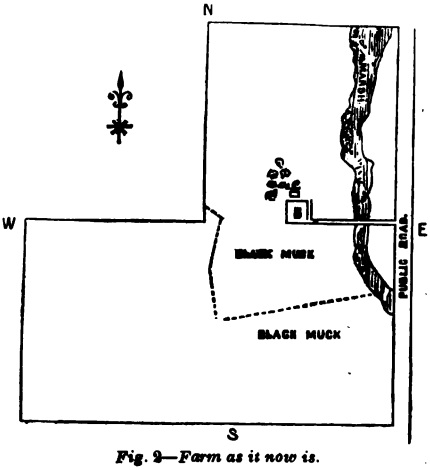


Fig. 2—Farm as it now is.

7. Placing the barn and other out-buildings as near the center of the farm as other circumstances will admit.

As a guide in the subdivision of a new farm, or in re-arranging an old one, we give a single example of a plan furnished a western correspondent at his request. The farm, before laying out, is shown in fig. 2, the land being all cleared, (the woodland a mile distant,) and all a sandy or clayey loam, except those portions marked as muck and marsh. The dotted line is a ditch, B is the garden, and C the house, and it is intended to build a barn north of the house, in order to secure a side-hill locality. The south side of the house would be a more central place for the barn, but the ground is unsuitable. The whole farm is rolling land, but has a general and gradual descent from the south-west to the north-east—and no part is too steep to plow. The whole contains about 120 acres.

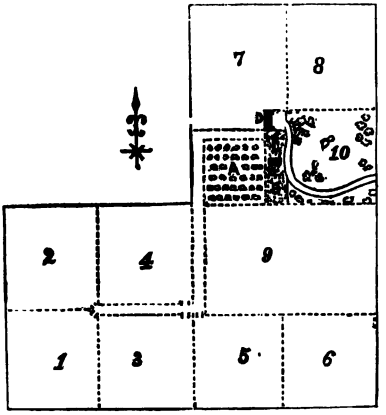


Fig. 3—Farm with proposed subdivisions

In fig. 3, we have given the plan which we propose for this farm. A more accurate knowledge of the surface might enable us to improve this plan, as we may possibly have run the lane which leads to the several fields over hills, which might be avoided by slight flexures, or by altering its position.

There are ten fields besides the orchard, containing about eleven acres each. If this is more than can be fenced at once, Nos. 1 and 2, may be thrown into one field, and the

same may be done with 5 and 6, and with 7 and 8, leaving only seven fields. No. 10, being intersected by the marsh, (which now affords heavy crops of wild hay,) and in front of the house, we have concluded to throw several acres into pasture, to plant a few trees to give it something of a park appearance, and to give a curve to the entrance road, to avoid the stiffness of straight lines. If thought best, less breadth may be given to this field, leaving it still wide enough to embrace the curved entrance. The grass is to be kept short by pasturing animals.

The soil west of the house being more sandy, we propose to occupy as an orchard. No. 7 may also be used for this purpose, if desired.

The barn is easily accessible, and fronting the east, the yard is protected from west winds.

Fields number 1, 2, 3, 4, 5, 6 and 7, if we understand the description of the land, will be dry land, and capable of entering any proposed rotation. No. 8 is largely marsh, and No. 9 low black muck. The former may therefore be mostly kept as meadow or pasture, and the latter for corn and turnips, or pasture and meadow. These low portions will need a large portion of timothy for seeding.

Fields Nos. 7 and 8, are entered from the barn-yard; 9, from the public road, or from the lane back of the orchard, or both; and No. 6, from the road. All the others are accessible from the lane.

The following rotations may be adopted, or varied from according to circumstances:

Three-course system—1st year, corn, potatoes, carrots, ruta bagas, with all the manure—2d, wheat—3d, clover, one or more years.

Four-course system—1st corn and roots—2d, barley and peas—3d, wheat—4th, clover, one or more years. The several arable fields will admit four years of grass in this course. If more wheat is desired in this course, a crop of wheat may commence the rotation, and precede the corn.

The engraving at the head of this article, represents a birds-eye view of a neat and well laid out farm, the dwelling being in front, and at the center, the garden and fruit garden, surrounded by an Osage orange hedge, being on the right, the orchard on the left, and the barn and other out-buildings in the form of a hollow square, at the back of the house. The fields, with plowman, sheep and cattle, are in the distance. A plan of this place is shown in fig. 4

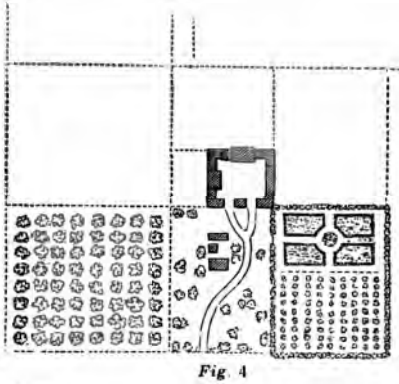


Fig. 4

The accompanying engravings are a plan (fig. 5) and view (fig. 6,) of the farm and buildings of Daniel D. T. More, of Watervliet, near Albany. The view

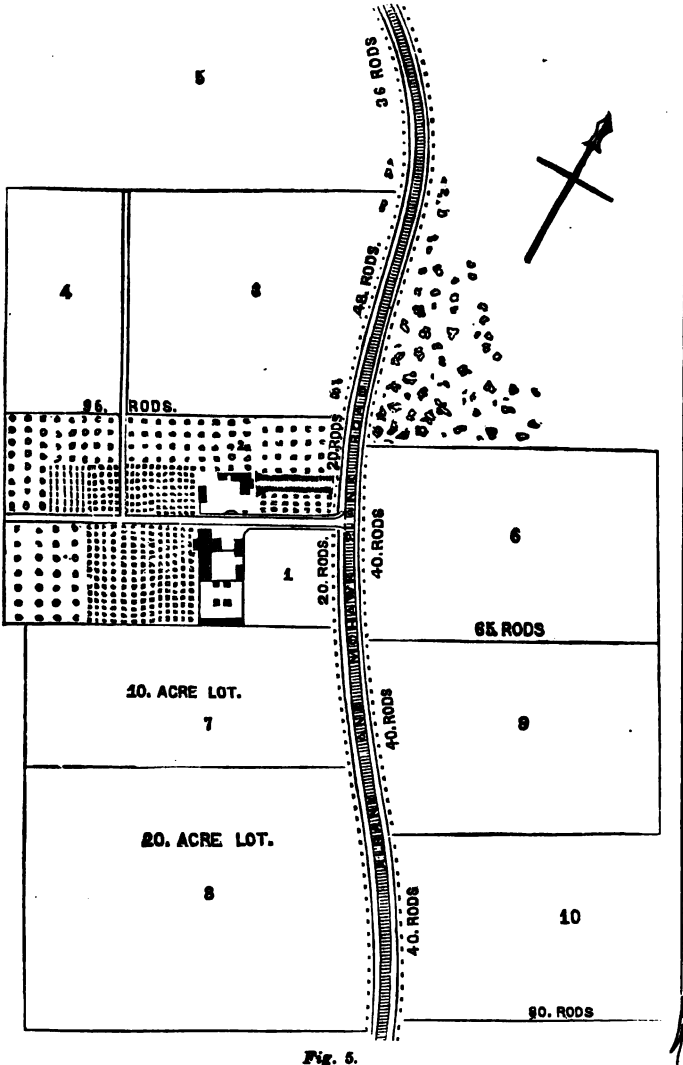

5
36 RODS
4
8
48 RODS.
25. RODS.
20 RODS
1
20. RODS.
40. RODS
6
65 RODS
10. ACRE LOT.
7
40. RODS
9
20. ACRE LOT.
8
40. RODS
10
80. RODS

Fig. 5.

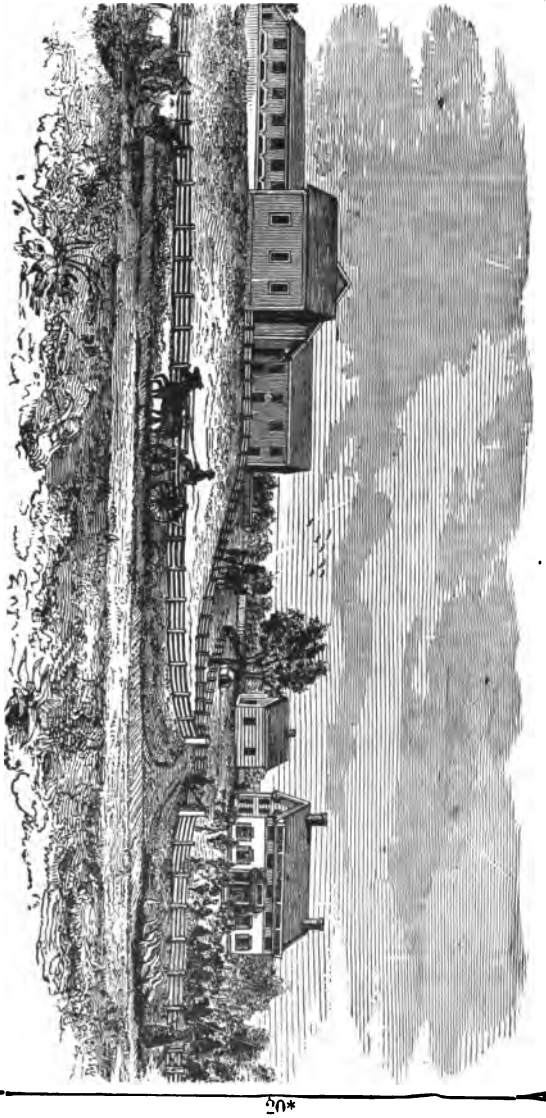


Fig. 1.

serves to explain the buildings represented in the plan. The whole is given as an example of a well laid out establishment, and to show the good management of the owner.

He purchased an old worn out farm of 185 acres, that had been so long subjected to the skinning system, that one hundred dollars was thought too high a rent for it—it having been let to tenants for fifty years, and for many years previously occupied by a tenant at will. The buildings and fences had nearly all rotted down. After paying all the purchase money on the farm that could be raised, more was left to pay annually as interest than had before been paid as rent. This was certainly a dull prospect for a beginning.

By skillful management, the owner was enabled so greatly to improve its quality, that in five years from taking possession, the receipts of the farm in one year, amounted to $4,852; the expenditures, including family expenses, were $2,174; leaving $2,678 as net profits.

The land was light—a sandy loam—and was at first so poor, that the two first years little else could be raised than white beans. The chief means of renovation were deep plowing, *turning in crops of clover as manure*, the application of plaster and lime, and of large quantities of purchased yard manure, and the adoption of a rotation of crops as soon as practicable. At the expiration of the five years, a substantial dwelling house, farm buildings, and fences, had been built, and all the interest and a part of the principal had been paid, besides the fifth year's profits.

The reader is referred to Transactions of the N. Y. State Agricultural Society, for 1850, for a full statement of the means adopted in the renovation of this farm, and of all the items of profit and expense.

FARM HOUSES.

THE ART OF PLANNING THEM.

The art of planning Farm Houses, like that of subdividing farms, should be reduced to a regular system. It is most commonly a mere chance process—a sort of hap-hazard arrangement of rooms, doors and entries, without the observance of any general rules.

When a farmer is about to erect a house, he should in the first place make two leading inquiries. 1, What are the accommodations I want? 2, What is the amount of means for providing them? In order to assist in answering these questions properly, it may be well to classify houses, from the most simple and cheap, to the most expensive and complex. But it is necessary in the first place, to examine which of the apartments of a dwelling are most indispensible, and which are of various degrees of secondary importance.

Every house must have a kitchen or place for cooking food, a living room for day occupancy, and a lodging room for night—and a pantry and store-room. In the simplest log-hut or board shanty, one room is made to serve all these purposes, the pantry being merely a cupboard, or tier of shelves against the wall. One step above this, is the separation of kitchen and living room, from the bed-room; and still better, is the ap-

propriation of three distinct rooms for these purposes. As we continue to ascend in the scale, we find at last, that the largest and most complete houses, have most of the following apartments, although all may not be found in any single house :

1. Kitchen, with appended iron closet, store-room, dairy, wood-room and laundry.
2. Bed-rooms, including nursery, and other sleeping apartments.
3. Dining-room.
4. Library, or office.
5. Bath-room.
6. Breakfast-room, parlor, sitting-room, or living-room.
7. Drawing-room and conservatory.
8. Entrance hall and veranda.
9. Cellar.

Now, going back to the two leading inquiries already mentioned, let every one about to build, ask himself: How many of these different rooms will be indispensible for me; and 2, what can I expend in procuring them? We suppose that no man, even with quite moderate means, will be satisfied without,

1. Kitchen and small pantry;
2. Parlor;
3. Nursery or bed-room on the ground floor;
4. Small entry;
5. Bed-rooms with closets above stairs;
6. Cellar.

The cost of a house containing all these, will of course depend much upon the nature of the materials, their cost, the size of the rooms, and the cheapness of the finish; but with a plain frame or wooden house, they could be had from six to twelve hundred dollars.

A larger and more complete farm-house, costing two thousand or more, would contain,

1. Kitchen, pantry, store-room, and iron closet;
2. Dining-room, and china closet;
3. Parlor or drawing-room;
4. Nursery or bed-room below stairs, with ample closets; and with bath-room attached;
5. Bed-rooms above stairs, with closets to all;
6. Office or library—which may be simply a small business room, for keeping account books, settling with workmen, making bargains, &c.; or a more complete library, with book-cases and newspaper closets, and even cases for minerals, dried plants, shells, stuffed birds, &c., according to circumstances.
7. Verandas;
8. Cellar.

After the greater or less number of these rooms has been fixed upon, according to wants and circumstances, the next step is to arrange them in the most convenient and economical manner. This is a difficult task to a person of inexperience, but it may be greatly assisted by observing the following rules, and by an examination of published plans, such for instance as we are about to give in the present number of the Register, or which have been furnished in the former numbers.

1. Let the kitchen (the most important apartment) always be on a

level with the principal floor—and for strong light and free ventilation, it should have, if possible, windows on opposite or nearly opposite sides.

2. The pantry or dish-closet should be between the kitchen and dining-room, and easily accessible from both.

3. There should be a set of *easy* stairs from the kitchen to the cellar, and also an outer set into the cellar for admitting barrels, &c.

4. More attention should be given to the arrangement and convenient disposition of such rooms as are in constant use, than those but occasionally occupied. Hence the kitchen and living room should receive more attention on the ground of convenience, than the parlor.

5. Every entrance, except to the kitchen, should be through some entry or hall, to prevent the abrupt ingress of cold air, and for proper seclusion.

6. Let the entry or hall be near the center o the house, so that ready and convenient access may be had from it to the different rooms; and to prevent the too common evil of passing through one room to enter another.

7. Place the stairs so that the landing shall be as near the center as may be practicable, for the reason given for the preceding rule.

8. Let the partitions of the second floor stand over those of the lower, as nearly as may be, to secure firmness and solidity.

ONE STORY FARM HOUSE.

A correspondent has sent us a plan of a farm cottage, with the request that we would suggest improvements, and which is here given to our readers in order to show how such improvements may be made. His chief object is *internal convenience*, with cheapness—outside appearance is a secondary consideration. Fig. 1 is a reduced plan of the sketch sent us, S, being the sitting-room or parlor; D, dining-room; K, kitchen; F, B, family bed-room; B, B, B, bed-rooms; P, pantry; W, woodhouse; p, porch; b, bath-room; c, c, c, closets. Our correspondent adds, "a useless hall is dispensed with, the doors opening outward, are protected by porch and veranda, the kitchen and dining-room are not separated by a long entry. If built one story high, it will not cost over $1,000."

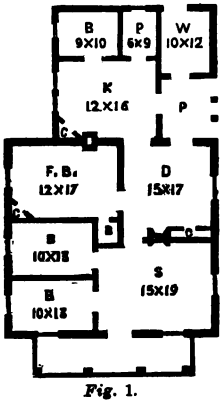


Fig. 1.

The defects of this plan, are,—1, the kitchen is not sufficiently lighted,—clean work requires a strong light; 2, the dishes must be carried through the whole length of the kitchen to the dining-room three times a day; 3, the bath is too far from the warm water of the kitchen; 4, the triangular closet in the nursery will not fit a square carpet; there are no stairs to descend to the cellar; 5, the house being 32 feet wide, the chamber would be *at least* 8 feet high in the middle, and no stairs or other provision is made for using this

large space. Bed-rooms opening directly into the parlor will not be so retired as opening into a hall, but will be more easily warmed from the parlor fire. The outer doors opening under the veranda and porch, are more exposed to the weather, than if a hall or entry intervene, but room and cost are saved—double doors, one opening inward and the other outward, will be an improvement. Every farmer must have boys or hired men—no provision is made for lodging them.

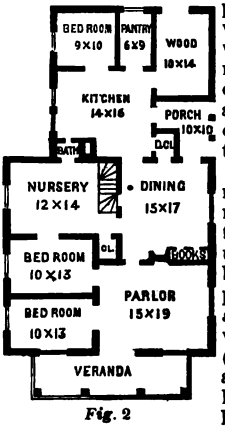


Fig. 2

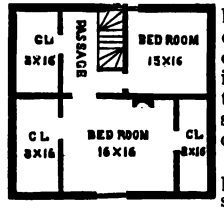


Fig. 3.

In fig. 2, we propose alterations, avoiding most of these difficulties. One of the bed-rooms opening into the parlor, has also a door to the nursery or family bed-room, so as to be used as a children's bed-room, the parlor door being kept locked; or *vice versa*. The bath is placed near the kitchen, and between them is a *slide*, in an opening two feet square, through which hot water is handed. The dish-closet (marked "D. cl.") is accessible to both kitchen and dining-room. The kitchen wing being 2 ft. longer, the wood-room opens directly to the kitchen. The stairs ascend to the chamber, which contains two useful bed-rooms, and three large closets, fig. 3. If the eaves are raised two or three feet higher than the second floor, four chamber rooms might be made for a larger family. An opening may be made from the head of the stairs to the kitchen garret. Beneath the stairs, is the descent from the kitchen to the cellar.

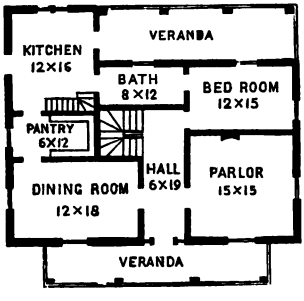
As suggested, we furnish at the head of this page, a view of the house as seen outside, constructed in the simplest and cheapest manner, so far as neatness will admit. A few additional

dollars would give it the simple Gothic finish shown in the lower figure on page 195 of our Illustrated Annual Register for 1856; and a larger sum would give the more perfect Gothic expression shown on page 31, of the Register for 1855.

A PLAIN FARM HOUSE.

This design is intended for a farm-house, where the entire outlay is devoted to convenience and comfort, and not a dollar to mere ornament. It has a special regard to furnishing the greatest amount of room at the least practicable cost for a substantial erection, the whole being afforded for fifteen to seventeen hundred dollars.

It will be observed the rooms are compactly disposed, so that those required in connection, are very easily accessible to each other, and no space is lost. The dining room is long and narrow, the most economical form for such an apartment; the kitchen projects in part from the main building, so as to secure a current of air through the opposite doors. The pantry being placed between them, is readily accessible to both, and also affords a passage from one to the other. As personal cleanliness is indispensable to a farmer, a bath is placed between the bed-room (which may be used as a *nursery*,) and the kitchen,—for fresh or warm water on one hand, and for dressing on the other. Those who do not need a separate bath-room, may convert this to a bed-room, or to



a milk-room, as circumstances may require. The cellar is reached by a descent placed under the kitchen stairs.

The arrangement of the second story is an exact copy of the lower, affording four bed-rooms opening into the upper hall; and two more for hired persons, over the pantry and kitchen, and entered by the kitchen stairs. Closets for the rooms may be taken off from them, on the outer sides, where the roof is lowest.

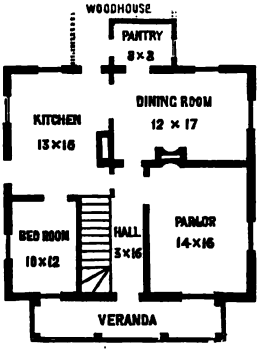
It will be observed that this house, although but little more than a story and a half, and twenty-eight by forty feet outside, furnishes no less than twelve rooms besides the hall, closets and cellar—a large amount for the cost, and therefore well adapted to the farmer who wishes the greatest amount of accommodation for a given expenditure. Those to whom the exterior appears too plain and destitute of ornament, will supply the deficiency by handsomely planted and neatly kept grounds, a mode, beyond all comparison, the cheapest and most satisfactory, for ornamenting country dwellings.

SQUARE FARM HOUSE.

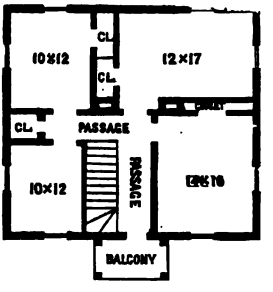
The most economical form for enclosing a given amount of room within the smallest practicable extent of outer wall, is that of a square. An octagon, it is true, exceeds the square in the area enclosed, but the impossibility of adapting it to the ordinary forms of rooms, renders it awkward, troublesome, and in fact extremely wasteful in expenditure.

The design here given is that of a house thirty feet square outside, furnishing four convenient rooms below, and the same number above stairs.

The bed-room, opening into the kitchen, is occupied by the heads of the family, and enables the mistress to give a ready superintendence of her work. As the kitchen opens directly into the entrance hall and to the stairs, but one flight is required to the second story. Under these stairs is the descent to the cellar. The dining-room is the ordinary family or living room.



GROUND PLAN.



CHAMBERS.

The four bed-rooms above stairs are all of ample size, and each is furnished with a separate closet. A passage leads directly from the head of the stairs through the glazed door to the balcony, which affords a pleasant retreat for summer evenings.

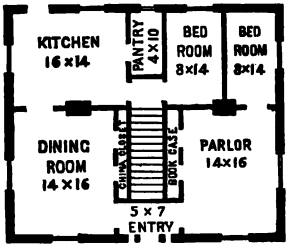
This house may be built for thirteen to fifteen hundred dollars, if executed in a plain and substantial manner of wood.

BRACKETED SYMMETRICAL FARM HOUSE.

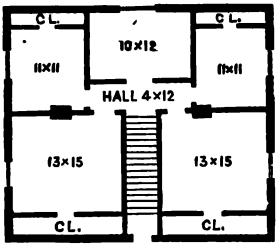
This design (see next page) which represents a house in a nearly square form, gives ten rooms within story and a half walls, the whole measuring only thirty by thirty-five feet inside. The rooms are probably as compactly arranged as can be possibly effected, not a single inch of the enclosed space being lost. The entry, 5 by 7 feet, conducts to the parlor on one side and to the dining-room on the other, the latter being also intended as the family or living-room. The stairs being flanked with plastered walls, are made at one-fourth the expense required where open on one side with railing or balustrade. The entrance to the cellar from the kitchen is under these stairs. The mistress of such a house as this, (which is intended for a farm of moderate size,) will superintend her own kitchen, and therefore her lodging room will need to be near at hand, being the bed-room which opens into the kitchen through the small entry at the head of the cellar stairs. The room adjoining this is a "spare room" for a visitor, opening into the parlor. The five rooms above may be all reached from the single flight of stairs; or if desired, one or two rooms for hired persons may be entered from a small narrow flight placed adjoining the pantry.

Ample closet room is obtained up stairs by occupying for this purpose the lower portions of the chamber, nearest the eaves, thus leaving for the bed-rooms the higher or more central portions.

The chimneys are so placed that every room below stairs, and all but one above, may be warmed by an open fire-place, or by stoves; and the stacks may be carried up almost perpendicularly from bottom to top, which is better for safety, cheapness and durability.



PRINCIPAL FLOOR.



SECOND STORY.

The dairy is in the cellar, and a woodhouse may adjoin the rear, or be built detached at a convenient distance. In the latter case, a double row of evergreen trees, with an avenue or path between, will be found convenient and pleasant in winter.

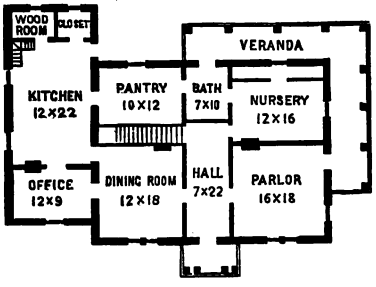
The exterior conveys an expression of cheerfulness and neatness; and has so small an amount of ornamental appendages, that the cost is scarcely increased by them. The window under the small front gable, inserted for lighting the upper hall and stairs, imparts a certain sheltered aspect, which is carried out by the addition of the window hoods over the lower windows.

This house, built in a plain and cheap manner, and including painting and window blinds, would not cost more than fifteen hundred dollars; substantially built and with a little more finish, it would approach nearer two thousand.

VILLAGE OR SUBURBAN HOUSE.

A residence with the Italian characteristics, but more symmetrical and regular in form than is adapted to the broad landscape of the country, is shown in this design for a suburban or village residence. The interior is readily understood from the plan. The stairs being placed between the pantry and dining-room, give the hall an airy and open appearance. The parlor opens on the veranda through double doors. The bath-room is readily accessible from the nursery; and also from the kitchen through the pantry, for the supply of heated water; and slops are carried from it through the back door.

The office—a room which every country and city resident should have, who wishes to avoid doing business and settling accounts in the parlor, or among the kitchen dishes—may be entered from the kitchen or dining-room, and an outer door may be added if desired. The kitchen is spacious to avoid the necessity of a separate laundry, and the back door being on an opposite side from the windows, summer ventilation is easily given. A door may be placed on each side. The interior entrance to the cellar, from the kitchen, is under the stairs from the hall. If desired, the pantry may open directly to the dining-room, across the platform at the head of the stairs.



The second floor, being quite similar to the first story, a separate plan is not given. Access to the upper hall is obtained by means of a passage along side the stairs, and separated from them by a railing. This hall

opens by means of a glazed door to the balcony. The cost of this dwelling, built in a plain, substantial manner, of wood filled in with brick, would be about three thousand dollars, varying however with prices of materials in different localities.

FARM MANAGEMENT AND CAPITAL.

The great leading error of most of the young farmers of our country is in not "counting the cost." The first thing they do is to expend not only all their capital in buying as large a farm as possible, but most usually they run largely into debt. Their desire for large possessions leaves them nothing to stock and improve the farm, and hence for many years, while loaded with a discouraging debt, their farms remain poorly provided with animals, with good implements and with a good supply of manure. They are therefore compelled to perform all their operations to a great disadvantage; their small crops afford no net profits, and they become discouraged and lose the energy and enterprise essential to success. These causes are the most fruitful source of poor and slip-shod farming in America. It is not very difficult, in traversing the country, to point out among the various occupants of the land, from the appearance of the premises, such as are burthened with heavy debt, from those who have a good supply of spare capital.

It has been remarked that in England, where taxes are levied on everything that a man wears and everything that he eats, and where the cultivator must farm well or not at all, the amount of capital to begin with, must be about as great in *renting* a farm, as in *buying* one in the best farming districts of our own country. The result is, everything is done in the best manner; and if farmers are *compelled* to farm well there or else become bankrupt and starve, why may we not adopt from *choice* the same advantageous course in this country,—to lay up handsome profits against a rainy day,—and be enabled to enjoy the rare gratification of feeling able to give liberally to charitable or useful objects, without deranging one's financial concerns?

One great reason why young (and often old) farmers are so poorly supplied with surplus capital after buying land, is, that they have never estimated how much they will want. An estimate of this sort would prevent many heavy purchases of farms and the entire consumption of means,—it would induce smaller outlays in land, and larger expenditures in the means for making heavy net profits. We therefore purpose, by way of affording some assistance on this subject, to point out what a moderate farmer actually and indispensably requires besides a farm and *good buildings*.

The *average* of farms in this country, will not perhaps exceed one hundred *improved* acres. The following will be required for commencing operations to advantage.

Live Stock.—This will vary much with the character and quality of the land, its connection with market, &c., but the following is a fair average, for fertile land, and the prices an average for different years, although lower than they have recently been :

3 horses, at $100	$300
1 yoke of oxen	100
8 mich cows, $25	200
10 steers, heifers and calves	100
20 pigs, $5	100
100 sheep, $2	200
Poultry, &c.,	10
	$1010

IMPLEMENTS.—To farm *economically*, these must be of the best sort, especially those that are daily used. A plow, for instance, that saves only *one-eighth* of a team's strength, will save an hour a day, or more than *twelve* days (worth $24,) in a hundred—an amount, annually, that would be well worth paying freely for in the best plow. A simple hand-hoe,—so well made that it shall enable the laborer to do one hour's more work daily, will save twelve days in a hundred,—enough to pay for many of the best made implements of the kind. These examples are sufficient to show the importance of securing the best.

2 plows fitted for work, and 1 small do	$25 00
1 cultivator	7 00
1 harrow	10 00
1 roller	10 00
1 seed planter	15 00
1 fanning mill, 1 straw cutter	40 00
1 root slicer	28 00
1 farm wagon, 1 ox-cart, one-horse cart, with hay racks, &c	180 00
Harness for three horses	50 00
1 shovel, 1 spade, 2 manure-forks, 3 hay-forks, 1 pointed shovel, 1 grain-shovel, 1 pick, 1 hammer, 1 wood saw, 1 turnip-hook, 2 ladders, 2 sheep-shears, 2 steelyards (large and small,) 1 half-bushel measure, each $1,	20 00
1 horse-rake	8 00
2 grain-cradles, 2 scythes	12 00
1 wheel-barrow	5 00
1 maul and wedges, 2 axes	6 50
1 hay-knife, 1 ox-chain	6 00
1 tape line, for measuring fields and crops	2 00
1 grindstone	3 00
1 crowbar	2 00
1 sled and fixtures	30 00
Hand-hoes, hand-rakes, baskets, stable lantern, currycomb and brush, grain-bags, &c., say	15 00
	$474.50

The addition of a subsoil plow, sowing machine, mower and reaper, thrashing machine, horse-power for sawing wood, cutting straw, &c., would more than double the amount, but young farmers may hire most of these during the earlier periods of their practice. A set of the simpler carpenter's tools, for repairing implements in rainy weather, would soon repay their cost.

Besides the preceding, the *seeds* for the various farm crops, would cost not less than $75; hired labor for one year, to do the work well, would probably be as much as $350; and food for maintaining all the domestic animals from the opening of spring until grass, and grain for horses till harvest, would not be less in value than $100; $525 in all.

For domestic animals	$1010 00
" implements	474 50
" seeds, food and labor	525 00
	$2009 50

That is, *two thousand dollars* are needed the first year, for stocking and conducting satisfactorily the operations of a good hundred acres of improved land; several items will doubtless be supplied or added to the list by the recollection of every farmer.

This sum will no doubt seem frightfully large to some who have never made a similar estimate; we would therefore request such to sit down and see how much they can reduce the amount, for vigorous and energetic farming. They will probably be surprised to find how few of the items they can spare without inconvenience or loss; and the question will arise, how can we command so large an amount? We answer, Buy smaller farms—expend less in land, and more in means to till it *well*. Much as we dislike running into debt, it is better to borrow money for the latter, than the far more common practice of borrowing to pay for land. For, by running in debt for land, followed by bad tillage, the young farmer will be long in extricating himself from a depressing load; while on the contrary, movable capital will enable him to perform every thing at the right moment of time, and in the very best manner. He will not be "too poor to be economical," but will often save much by a little timely outlay.

A single example will show the economy of a prompt use of means. Two farmers had each sown a crop of ruta bagas. The first, who was always enabled to take time by the fore-lock, hoed the young weeds when only an inch high, with very little labor, and the young plants grew vigorously. The other, being crowded in his work from deficient calculation, and consequently deficient help, was compelled to defer his hoeing ten days, when the weeds had grown six inches high, and had half smothered the crop. The labor was more than triple the former, and the crop greatly inferior. We could multiply instances of all kinds bearing in the same direction, and showing that the farmer who in his eagerness to possess many acres, weakens his means for present action, not only adopts the worst kind of economy, but compels himself to continue in this losing system for years to come.

Agricultural Experiments.—A great many valuable hints and suggestions for practice may be learned from agricultural papers. It is not uncommon to hear farmers remark that they have derived more pecuniary advantage from a single article, than the price of the paper for many years. But to prevent disappointment, farmers must always use their judgment; circumstances vary so greatly, that what is highly beneficial in one case, may be ruinous in another. Great mischief is done by looseness, carelessness, or partiality in reporting experiments; a single trial of a crop, sown by guess-work, cultivated at random, and measured by a hasty glance of the eye, is often considered decisive by the inaccurate farmer. He sees a little, presumes a great deal, and jumps to a conclusion, when perhaps if he had taken the twenty other operating causes into the account, there would have been no conclusion at all. Opinions are sometimes formed and facts afterwards sought to support them; the report of such facts is not worth the ink that records them. It is no wonder that some are disheartened by these, from all trials.

FARM IMPLEMENTS.

In the previous chapter, the importance of good farm implements has been pointed out, and a simple list of those in most common use, furnished the reader. A more particular notice, with figures, of those which modern improvement has pointed out as among the best, will doubtless be acceptable to young farmers.

PLOWS.

Nothing shows the improvement of modern agriculture more conspicuously, than the difference between the old and new plows. The "old plow" is still used in many countries, where farmers do not enjoy the benefit of agricultural periodicals. Fig. 1, represents the plow at present used in Morocco. It would hardly receive the premium of the State Agricultural Society, and has probably never been patented. It may however be made very cheaply, the point only being shod with iron. In the less civilized regions of Morocco, the plow consists only of a crooked limb of a tree, with a projecting branch sharpened to a point for scratching up the ground. The Moors do not take the Agricultural papers.

FIG. 1.—MOORISH PLOW

One of the best plows used in Baden, in Germany, is exhibited by Fig. 2. It is quite similar to the best plows of ancient Greece and Rome, (except some of them had a wheel under the beam,) and is not unlike the "bull plow" used fifty years ago in this country. Thro' the genius and untiring labors of Jethro Wood and of those who have succeeded him, the cast-plow has been introduced on every farm in the Union, and has been the means of effecting a pecuniary gain, in the aggregate, first and last, of several hundred million dollars.

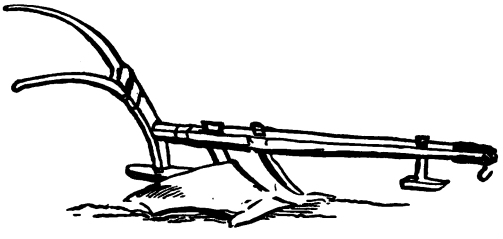


FIG. 2.—BADEN PLOW.

A few engravings, representing some of the best modern plows, will prove interesting to such of our young readers as are looking for the best forms of this indispensable implement. Fig. 3 exhibits Prouty &

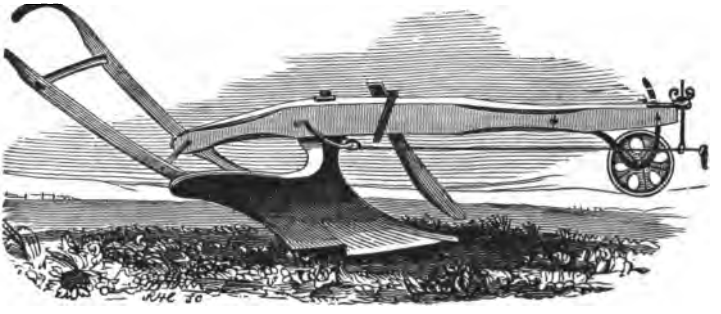


FIG. 3—PROUTY & MEARS' CENTER DRAFT, FOR SANDY SOILS.

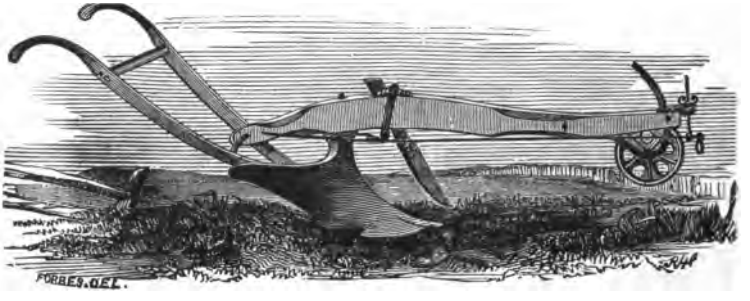


FIG. 4—PROUTY & MEARS' CENTER DRAFT FOR CLAY SOILS.

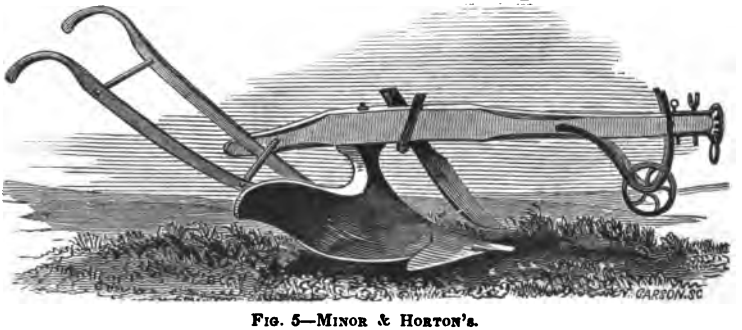


FIG. 5—MINOR & HORTON'S.

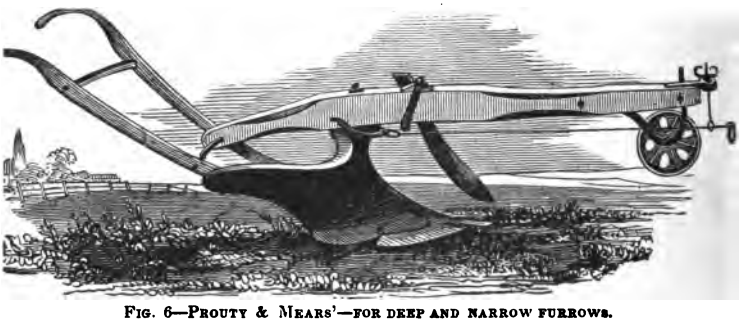


FIG. 6—PROUTY & MEARS'—FOR DEEP AND NARROW FURROWS.

FIG. 7—CHASE'S AMSTERDAM

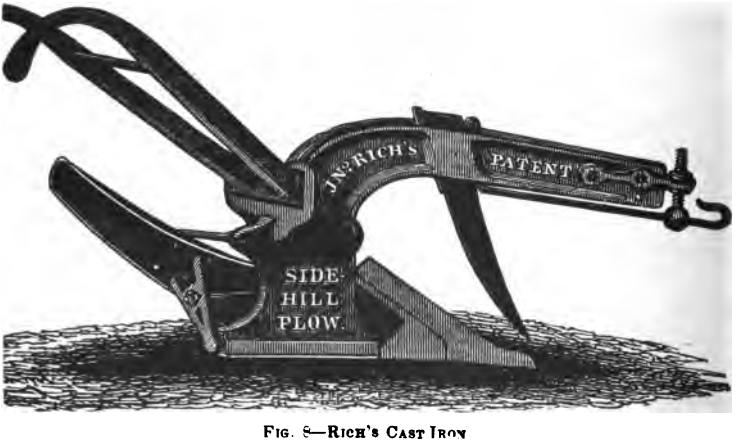


FIG. 8—RICH'S CAST IRON

Mears' Center-Draft plow, the form of which is intended for light or sandy soil; and Fig. 4, the same implement varied to adapt it to stiff or clayey soils, giving less surface of mouldboard and less friction for adhesive earth. Fig. 5, is Minor & Horton's Peekskill plow, intended for both fallows and stiff soils; and Fig. 6 is Prouty & Mears' plow, constructed with special reference to deep and narrow furrows, and intended for stiff soil. Chase's Amsterdam plow, shown by Fig. 7, exhibits a good form for a plow to be used in light soils.

FIG. 9—RICH'S SIDE-HILL

These different modifications of the cast-iron plow, do not vary essentially in the main points of construction, from a large number of excellent implements manufactured throughout different parts of the country.

An implement of simple con-

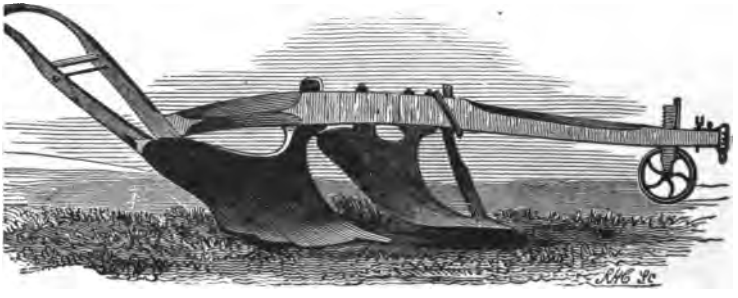


FIG. 10—MICHIGAN SOD AND SUB-SOIL

FIG. 11—SUB-SOIL PLOW.

struction, very durable when of good iron, and much valued in many places as a sward plow, is Rich's cast-iron beam plow, shown in Fig. 9. Rich's cast-beam side-hill plow, is exhibited by Fig. 8.

French and Smith's celebrated "Sod and Sub-soil" plow, more commonly known as the "*Double Michigan,*" is shown by Fig. 10. This is a most valuable implement in all cases where deep plowing proves advantageous. Nothing is equal to it for turning under sward deeply, or any vegetable growth on the soil. The forward or small mouldboard skims the surface, taking off a few inches of the top of the sod and laying it in the bottom of the previous furrow; and the second or large mouldboard turns up what is left, and completely buries the former. Three strong horses will draw this plow when of the smaller size, and will run a furrow eight or nine inches deep; but the larger sized plow requires nearly double this force, and will cut a furrow a foot deep. The writer has used one which required three yoke of oxen to do it justice, and in an old pasture, beaten down hard, has turned up a furrow which measured eleven inches and a half as an average, from the unplowed surface down, and twenty inches from the top of the newly turned earth to the bottom of the furrow—thus loosening the soil up eight inches higher than it stood before,

The Michigan plow prepares sod ground in the best manner for planting corn, the mellow soil which is thrown on the sod, being deep enough to allow a coat of manure to be buried afterwards a few inches by means of a gang-plow.

When the sub-soil is of such a nature as not to enrich the top soil when thrown up and mixed with it, or when it is desirable to loosen up a deep bed of mellow earth to serve as a reservoir for moisture, the *sub-soil plow* (fig. 11) serves a valuable purpose. It is also useful for loosening the soil to allow the trench or Michigan plow to enter more fully to a greater depth.

The sub-soil plow merely loosens the earth but does not turn it up to the surface. It is made to follow in the furrow of a common plow, as shown in figure 12. It runs much deeper than the trench plow,

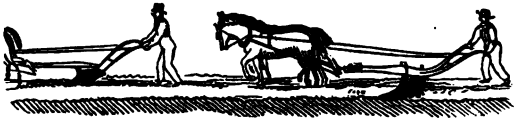


FIG. 12—SUB-SOIL PLOWING

with the same force of team. Four horses attached to a strong plow, running in a furrow seven inches deep, will loosen the earth to a depth of fifteen to eighteen inches. The benefit of subsoiling depends essentially on keeping the ground well drained; for if the loosened earth is afterwards allowed to become thoroughly soaked or flooded with water, it soon becomes compacted together again, and the operation proves of no permanent advantage. This is one fruitful source of failure.

HARROWS AND CULTIVATORS.

The Geddes Harrow is one of the best in use. The teeth being situated considerably back of the point of draught, its motion is more even and steady, and consequently easier for the team. In consequence of its wedge-form, it passes obstructions more readily. The center or draught-rod forms a set of hinges, by which it becomes adapted to uneven ground, or by which it may be easily lifted to discharge weeds, roots or other obstructions. Or it may be doubled back and carried easily in a wagon. The accompanying figure (Fig. 1) renders its construction perfectly intelligible without further description. To prevent its rising in the middle as it has been found to do when the draught traces are as short as easy draught requires, the chain is attached to the bar on each side, as shown in fig. 2.

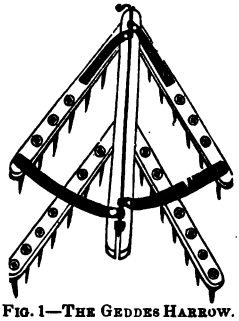


FIG. 1—THE GEDDES HARROW.

FIG. 2.

Hanford's Harrow, a modification of the Geddes Harrow, differs from the latter in the hinges operating crosswise instead of lengthwise or in the direction of the draught. The forward and back part are each made a distinct and solid piece, connected together by two clevises and a link. In crossing a ridge or depression, it adapts itself readily to the surface; or if an obstruction should raise the forward frame, the back one is not raised at the same moment as in the Geddes harrow. A convenient size, in constructing this harrow, is to use three by four scantling; to make the wings about five feet long, and the spread about six feet across behind. The brace of the forward frame has three teeth behind it on each side, and the back frame but two, as shown in the figure. A common clevis causes the forward harrow to rise from the ground; it should be therefore bent upwards about two inches, as the cut represents. Such a harrow as this will not easily become clogged or obstructed by stones; but on fine, clear earth, the teeth may be smaller and more numerous, without inconvenience.

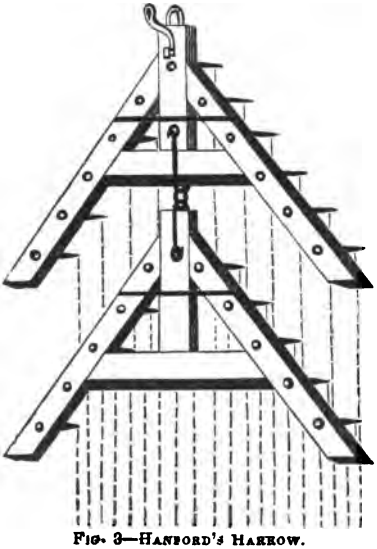


FIG. 3—HANFORD'S HARROW.

The Scotch or square harrow, (fig. 4) when made of light timber, and numerously furnished with small teeth, is a capital implement on land free from stones, for fine pulverization.

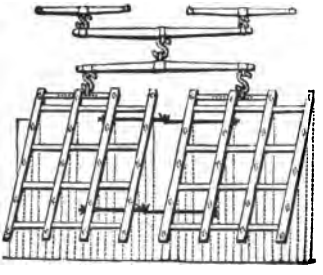


FIG. 4—THE SCOTCH HARROW.

An improvement, at increased cost, is made in Harrow-teeth by passing the upper end of the teeth through from below, until they reach a shoulder and washer, when they are secured with a nut on the top. Harrows will run easier, if the corners, and not flat sides of the teeth, are placed foremost, so as to cut like a wedge. We do not see why cast-iron teeth for coarse harrows might not be adopted, made flat, and cutting with the sharp edge.

CULTIVATORS.—The form of the common one-horse cultivator, for working all hoed crops, is well understood; but an advantage would result in a greater variation in the form of the teeth, according to the requirements of the soil, than is commonly adopted. Fig. 5 shows the usual form of teeth made of steel plates, and which are best adapted to mellow ground, kept nearly free from weeds. In foul land, longer shanks to the teeth are requisite, to prevent clogging. Where the ground becomes hard, or where it is desirable to loosen it to a greater depth than the common teeth will penetrate, they should have the form of the sharp claws shown in fig. 6. It often hap-

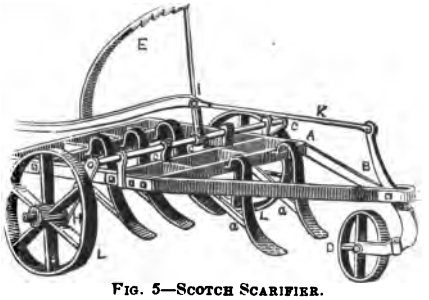


FIG. 5—SCOTCH SCARIFIER.

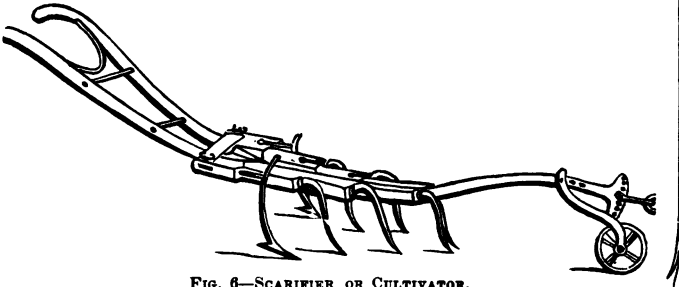


FIG. 6—SCARIFIER OR CULTIVATOR.

pens in ordinary practice that the one-horse cultivator works to best advantage when these two forms are combined in the same implement; the claws being placed forward, where they will turn up the crust in advance of the common flat teeth, and where they will be near the center of the space between the rows, and remote from the roots which they might otherwise injure.

The two-horse cultivator has been found valuable for preparing inverted sod land for wheat, by pulverizing the surface without tearing up the covered turf, thus diminishing the labor of preparing fallows, and leaving the decaying green crop untouched. Fig. 5 represents an English implement, precisely similar in operation to the American two-horse cultivators, but made wholly of iron, and raised or lowered as required, by simply raising or lowering the handle which projects behind. Lowering the handle throws the forward and two back wheels more immediately under, and elevates the teeth; while an opposite movement allows them to sink into the soil.

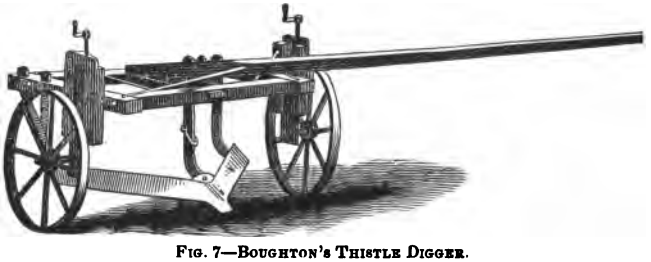


FIG. 7—BOUGHTON'S THISTLE DIGGER.

In land infested by Canada thistles, or by other weeds with deep roots, Boughton's "Thistle Digger," fig. 7, has been found very effective. It has a cast-iron cutting blade, (steel would be better,) made in the form of a V, the point running forwards, and by means of the regulating screws, lowered so as to shave off all roots of weeds and grass a few inches beneath the surface.

PLANTERS AND SOWERS.

The modern practice of planting seeds in hills or drills by means of machines contrived for this purpose, secures two important advantages. They effect a great saving of labor, whether used by hand or worked by horse labor; and by the uniform and accurate distribution of seed, give more uniform and consequently larger crops. The evenness or straightness of the rows

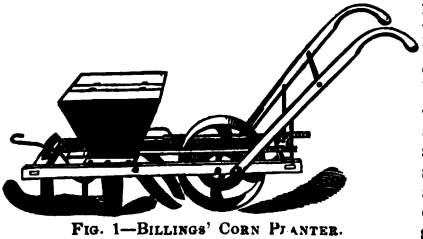


FIG. 1—BILLINGS' CORN PLANTER.

of hoed crops, planted by good machines, admits the closer working of the plow and cultivator, and thus saves a considerable amount of hoeing by hand.

BILLINGS' CORN PLANTER.—(Fig. 1.) This is one of the best planters in use. It is drawn by a horse, and will plant 7 or 8 acres in a day. It drops guano, bone-dust or any other concentrated fertilizer, with the seed, covering and rolling at one operation as fast as the horse will walk. It will drop in hills or drills, and answers well for sowing corn fodder. It does its work well on inverted sod. It is made by Billings & Bryant, of South Deerfield, Mass., at $15.

Another excellent machine proved by several years' trial, is EMERY'S PLANTER, (Fig. 2.) It measures the seed, deposites it in hills or drills at pleasure, dropping nearly all kinds of seeds, corn, beans, carrots, beets, &c. covering and rolling at the same time. The price is $14.

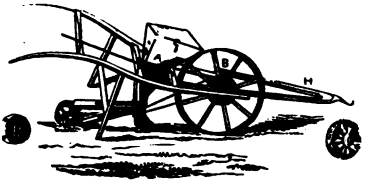


FIG. 2—EMERY'S PLANTER.

A machine for hand planting, much used at the West, is that of RANDALL & JONES (Fig. 3.) It plants two rows (in hills) at once, and from numerous statements of those who have tried it, appears to be very successful in its work. A man will plant eight or ten acres in a day. An acre was planted, on trial, in twenty-five minutes. It does its work evenly and neatly, the ground needing previous marking. It is made by Randall & Jones, Rockton, Ill., and sold for $10.

FIG. 3—RANDALL & JONES' CORN PLANTER.

SEYMOUR'S BROADCAST SOWING MACHINE (Fig. 4) is the best which has been extensively tried, for sowing easily and evenly any kind of grain or grass-seed, plaster, ashes, lime, guano, or other pulverized fertilizer. It is drawn by one horse, and sows ten feet wide, and the quantity may be made to vary from half a bushel of plaster to forty bushels of lime per acre; or it will deposit any desired quantity of seed. The price is $55, made by C. H. Seymour, East Bloomfield, N. Y.

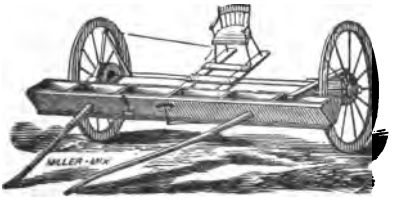


FIG. 4—SEYMOUR'S BROADCAST SOWING MACHINE.

GRAIN DRILLS, for sowing all broadcast crops in drills a few inches apart, and covering the seed at a suitable depth, have effected a marked increase in grain crops, by the even distribution of the seed, by placing it at a uniform depth, and by securing wheat crops in a great measure from winter-killing. The two most widely approved are *Bickford & Huffman's*, (fig. 5) manufactured at Macedon, N. Y., and *Seymour's*, (fig. 6) made at East Bloomfield, N. Y. Horse-hoes have been added

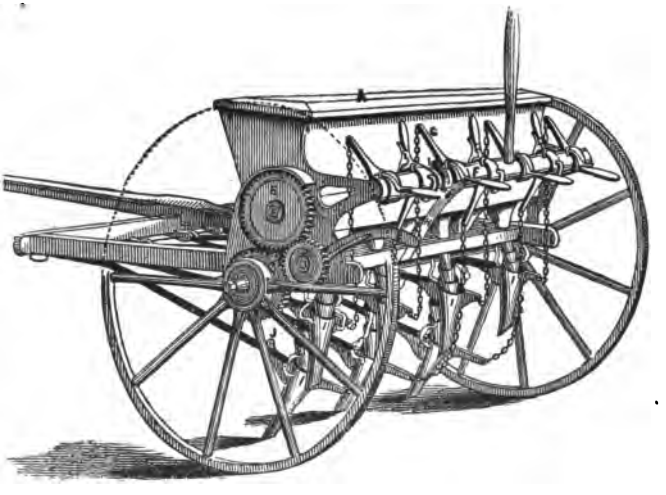


FIG. 5—BICKFORD & HUFFMAN'S SEED DRILL.

to the latter, for dressing out several rows of the drilled crop at once, like Garrett's celebrated English Horse-hoe. These two drills vary in price from about $70 to $100, and both have received the highest premiums from some of the State Agricultural Societies for their excellence and value. They are generally adopted and used by all the best farmers in most of the finest grain-growing districts of the country.

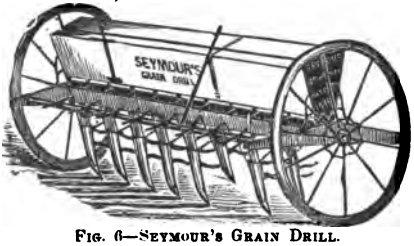


FIG. 6—SEYMOUR'S GRAIN DRILL.

MOWING MACHINES.

It is one object of the Register, to give the latest and most reliable information on improved labor-saving machines. Nothing has tended more to relieve the farmer of a heavy burden at a time when labor is scarce and only secured at high prices, than mowing and reaping machines. Many large land-owners would now find it nearly impossible to secure their hay and harvests, if they were compelled to return to hand labor—to mowing, reaping and cradling.

In the Register for 1856, a figure and description were given of Allen's Mower, the value of which had been tested by observation and trial of the writer. This year, a similar trial has been made of "Wood's Improvement" on Manny's Mower, and the result has been in the highest degree favorable. About twelve acres of grass were cut, on land belonging to the writer, which had been recently occupied, and was in a bad condition for the successful working of any mower. A part of the former crop had been suffered to decay upon the ground; and the knives had to shear their way through a mixture of dead and living "June grass," mice nests and clover, the whole of several acres more or less lodged, and much of it badly so. With all these difficulties, the mower was clogged but few times. On another and smoother meadow, mostly erect timothy grass, it was not clogged during several hours' cutting. The whole was mowed much better than by hand. The horses moved slowly, and averaged an acre per hour—which would be the amount, if four feet were cut at each passing, and the speed were two miles per hour. In common, every-day work, it should not exceed this. The total expense paid for the mowing was seventy-five cents per acre; raking with a revolver, less than twenty-five cents; product about two tons per acre; cost of making hay, from standing grass, to winrows, *fifty cents per ton*.

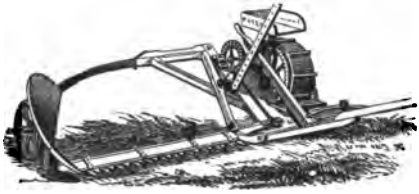


Fig. 1—Wood's Improved Mowing Machine.

Ketchum's Mowing Machine, originally the best, but now equalled by several competitors, has with others been much improved of late years, and is worthy of high recommendation. Those who purchase mowing and reaping machines, should remember that such should be selected as not only evince the best contrivance or invention, but which are also *manufactured* in the best manner and of the best materials. We have known some celebrated machines of different patents, to fail because they were not well made. An important advantage of mowing machines, is that they leave the hay already spread for drying, and obviate the use of the hay-spreading machine.

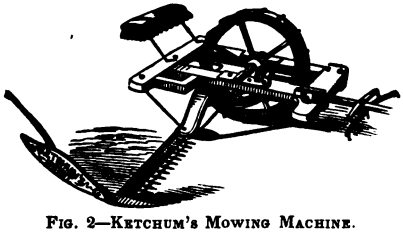
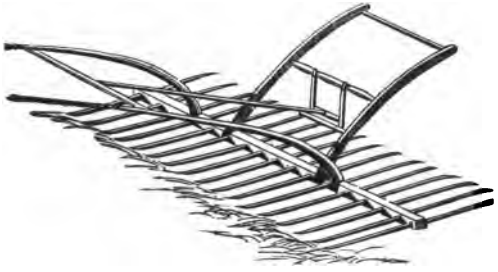


Fig. 2—Ketchum's Mowing Machine.

The mowing machine, if owned by the farmer who uses it, will enable him to cut his hay at less than one-third the cost required for hand mowing; and if all the farms in the Union were supplied, they would save annually over $6,000,000, in cutting the sixteen million tons grown in the States.

THE REVOLVING HAY-RAKE.

We like the old revolver the best of the several hay-rakes for all purposes combined. The spring-tooth rake is excellent for grain stubble, but too weak for heavy meadow. Each of the other sorts have some objections. The revolver supplies all purposes best, so far as the writer's observation goes.

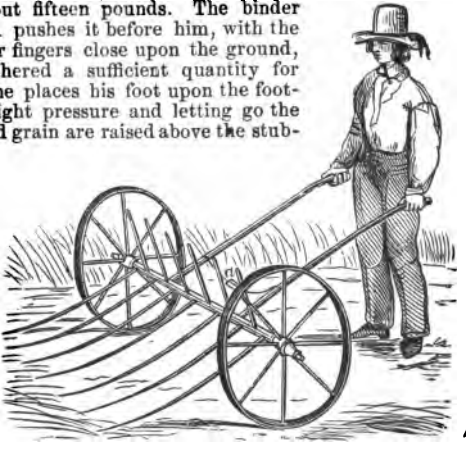


REVOLVING HORSE-RAKE.

A well made rake (costing about 7 or 8 dollars) will sweep a space averaging ten feet wide; and as the horse only stops at the ends of the field, a gait of two and a half miles an hour will rake over two acres an hour, allowing one-fourth of the time for turning at the ends, stopping for obstructions, &c. This has been often and easily accomplished. Where meadows yield one and a half to two tons per acre, the cost of raking together into winrows, need not be ten cents per ton.

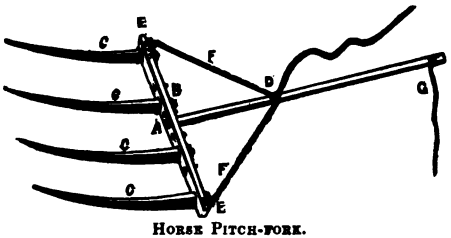
GRAIN BINDER'S WHEEL-RAKE.

This is a labor-saving implement, used extensively in several States. It is light, weighing about fifteen pounds. The binder takes the handles and pushes it before him, with the points of the teeth or fingers close upon the ground, and when he has gathered a sufficient quantity for binding into a sheaf, he places his foot upon the foot-piece, (*a*) and by a slight pressure and letting go the handles, the fingers and grain are raised above the stubble, when it is readily bound, the binder being required to stoop much less than in the old way of reaching to the ground. When the sheaf is bound and thrown aside, the foot is removed from the foot-piece, the teeth drop down, and the handles rise ready for the next operation.



HORSE PITCH-FORK.

This simple and efficient implement is now extensively used in many of the States. It was described in the Cultivator in 1848, from which a late correspondent (P. P. PECKHAM, Bradford Co., Pa.) made the first used in that region; he says there are now at least 200 in use, and some say they would not part with theirs for $100 if no other could be had. The following is the account formerly published in the Cultivator.



HORSE PITCH-FORK.

A, is the head, 28 inches long, and 2¼ inches square, of white oak, or some other strong wood. B, is the handle, 5½ feet long, mortised into the head, with an iron clasp of band or hoop iron to fit tight over the head, and to extend six inches up the handle, secured by two good rivets through the handle, to increase its strength—*c*, *c*, *c*, *c*, the prongs of the fork, made of good steel, and of the right temper, ½ an inch wide at the head, and drawn out tapering to the point. They are to be 20 inches long, 8 inches apart in the head, with a burr to screw them up tight, and a rivet on each side of the middle prongs, to keep the head from splitting. E, E, staples, riveted over the end prongs, to which the rope, F, F, is to be attached—the rope to be drawn together 8 feet from the head in the form of an A, and then the single rope to extend from that over a tackle-block, which is hung to a rafter at the peak of the roof of the barn, and two feet over the side of the mow, and thence to the bottom of the door-post, where another tackle-block is attached, under which the rope passes. G, is a small rope, attached to the end of the handle, by which the fork is kept level as it ascends over the mow. As it approaches the place where the hay is to be left, the rope should be slackened in the hand, when the hay will tilt the fork so that it will discharge its load immediately. The fork when loaded, is raised by a horse, which is attached to a swingle-tree to which the rope is fastened, near the lower pulley or tackle-block above mentioned. When the hay is discharged from the fork, back up the horse and be ready for another fork-full. The fork is drawn back by the small rope. In this way forks-full can be picked up nearly as quick as they can be by hand.

A farmer that has a large quantity of hay to pitch, will more than get pay for the trouble and expense of a fork of this kind in a single year. With the assistance of a boy to lead the horse to the fork, a man can with ease pitch off 6 tons of hay per hour, and pitch it from 15 to 20 feet high. On a trial of speed, I have pitched a ton 15 feet high in 4 minutes. The fork does not cost over $5 without the blocks and ropes, and I think they can be had all together, ready for putting in operation, of Garret Brown, Newtown, Bucks Co., Pa., for $7.

DOOR LATCHES.—A great deal of noise about house may be prevented by keeping latches and locks properly oiled.

WASHING MACHINES.

The best washing machine we know of, is one the writer has used for ten years and is exhibited in the accompanying figure. It is worked by an alternating motion of the handle or lever A, which turns on the central hinge or joint B, pressing the perforated board which swings like a pendulum within the trough by means of the connecting bar C, against the grooved side of the trough beyond. Fig. 1, is the whole machine; Fig. 2, the handle and bar C, detached, showing the notched end of the bar, for regulating the space for the clothes. The handle and bar are cast iron. The perforated board and its suspending frame, are easily lifted out whenever necessary.

Fig. 2.

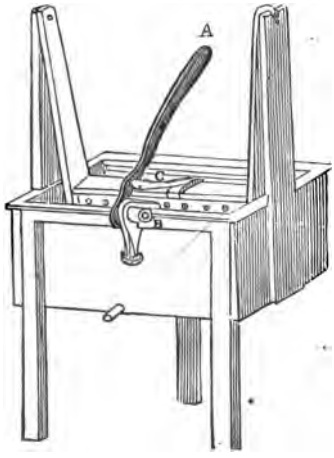


Fig. 1.

The box or trough must be made very strong, for the pressure exerted against the side by means of the lever, is enormous. At the first motion of the handle, the pressure is only five or six times as great as the strength of the person working it, but as it approaches a horizontal position, it becomes greater and greater, precisely like that of the *lever printing press*. A little care is required in regulating the quantity of clothes, so as to admit the lever being brought down to a level position as the finishing stroke is given.

So great is the force of pressure exerted upon the clothes, by the last or finishing motion of the lever, that a boy ten years old can work the machine with ease, and it does not require more than one-third the labor needed in washing with the old-fashioned *wash-board*, and does not wear or chafe the clothes in the least degree. A great advantage found in working it, is that one's weight is *thrown upon* the lever, and it accordingly possesses that particular superiority of the application of strength found in rowing a boat, the only difference being in pushing instead of pulling.

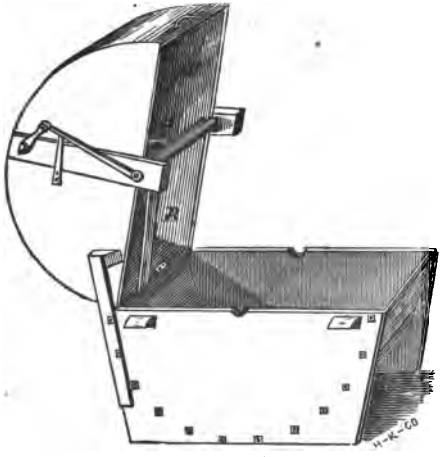
Machines on this principle are made and sold in various parts of the country. Some are made too complex, being encumbered by a wheel and needless appendages. The simpler the better. The writer used one about ten years, without fifty cents of repairs. The cost need not exceed five or six dollars.

A simpler, and an excellent washing machine is made by fastening a common wash-tub to a stand made of a common plank-bottom chair, with

the back off; fastening radiating ribs to the bottom of the tub (that is, ribs pointing in every direction outwards from the center); and then making a circular board just to fit loosely within the wash-tub, also with ribs on the lower side radiating from the center. The tub has a perpendicular axle in the middle of the bottom, on which the circular board is placed by means of a hole in its center, and a cross horizontal handle is fixed to the moveable circular board, resembling the handle of a common augur. To use the machine, clothes and water are placed in the tub, the circular board is placed upon them, and then, by means of the augur-like handle, this board is turned backwards and forwards, rubbing the clothes between the two ribbed or grooved faces. The operator's weight being naturally thrown upon the handles, gives the machine more efficiency. It is harder to work than the one last described, but it will work faster and wear out clothes rather more rapidly, the first named machine "*rubbing*" them none whatever. Two persons, one at each end of the handle, will work it quite easily.

FEED MIXER.

Economical farmers cut their straw, stalks and other coarse fodder and mix it moistened with meal, for feeding cattle and horses. Cut and moistened food is of great importance to horses affected with the heaves. A difficulty occurs in mixing the meal; the water employed to make it adhere, settles to the bottom, and feeding-troughs often become thus gradually filled with ice in winter.



WELTON'S FEED-MIXER.

To prevent this difficulty, H. V. WELTON has constructed and described in the *Country Gentleman*, a simple and efficient mixer by which several bushels of cut fodder may be coated with moistened meal in half a minute, and leave no water at the bottom. It operates something like a cylinder churn; the feed is placed in a semi-circular trough, and mixed by revolving arms turned with a long crank—a short one will not have power enough. The trough is made of sheet-iron, the edges of which are fitted into semi-circular grooves made in the side-boards, which are kept to their places by cross-rods, the heads of which are seen in the cut. The arms are placed near the ends and at

the middle of the axle, and only on one side, so that they may be turned up and not prevent the lid shutting down. A sheet-iron trough is found to be more easily cleared of ice—it should be painted—and a wooden shovel used, so as not to scrape it.

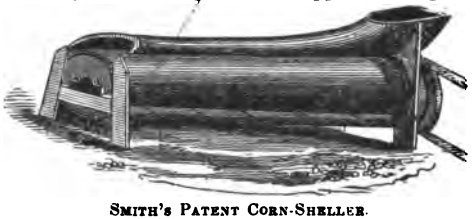
CORN SHELLERS.

The "CLINTON CORN-SHELLER" has been in use many years. With two men, two hundred bushels of ears may be shelled in a day, or with a double hopper, so as to shell two ears at a time, double that amount may be done by three men—quite an improvement over the old mode, yet in use in many places, of thumping out the cobs by the tedious process of hand flails. The price of this sheller is from ten to thirteen dollars. How much will be saved by it, every farmer can easily estimate after he has tried it.

CLINTON CORN-SHELLER.

There are several other corn-shellers, of good construction, which possess similar advantages to the above.

SMITH'S PATENT CORN-SHELLER, for shelling corn on a large scale, is probably the best machine in use. It is a horizontal toothed cylinder, six feet long, and fourteen inches in diameter. It can be operated by water, steam, or horse-power, and hence would be very valuable in the western states, where Indian corn is grown in very great quantities. "The ears of corn are confined in the operation to a part of the upper or rising side of this cylinder, by means of a cast-iron concave or case extending the whole length of the machine; and the corn being shovelled in at one end is driven through, and the cobs discharged at the other, while the corn falls below, being admitted by the small space on either side of the cylinder. The operation is governed by elevating or depressing the discharging end, which causes the machine to discharge the cobs fast or slow, and of course operating more or less upon them, thus securing to the operator the means of finishing his work. It is capable of shelling two hundred bushels of ears per hour with a two-horse power. Price $45 and $50."


SMITH'S PATENT CORN-SHELLER.

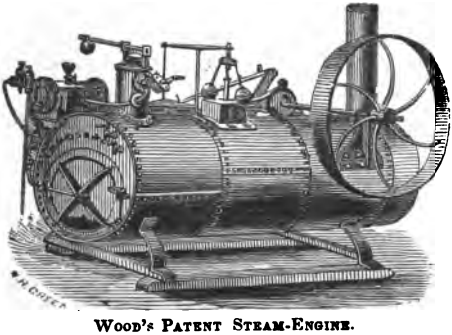
EVERYTHING IN ITS PLACE.—The man who loses half an hour daily going for or hunting displaced tools, loses 150 hours per year, or about half a month working time.

DEDERICK'S NEW HAY-PRESS

DEDERICK'S HAY-PRESS.

The close packing of hay for market has become an important object. One of the best machines for this purpose is DEDERICK'S new press, as shown in the accompanying cut. It is a toggle or progressive power press,—its chief improvement being in the parallel arrangement of the toggles, which are so placed that one is near one end, and the other near the other end of the follower; and its movement cannot have any other friction to overcome than that of the material it is pressing. The bulk and weight of the machine are so greatly reduced that the farmer can now have the hay press transported to him as conveniently as by its use he can transport his hay to market. It is worked by a horse upon a capstan—requiring him to make only 5 or 6 circles on a 7 foot sweep to make a bale. With 2 men and a horse, it will bale from 5 to 8 tons of hay per day. Price $100 to $175, according to size. Made by WM. DEERING & Co. of Albany.

WOOD'S PORTABLE STEAM-ENGINE.



WOOD'S PATENT STEAM-ENGINE.

In England where iron-work and coal are cheap, and horse-labor dear, the steam engine has long since become an essential machine on nearly every large farm. Its increased perfection and economy of fuel, are facilitating its gradual introduction among the larger farmers of this country.

A. N. WOOD & Co. of Eaton, Madison Co.,

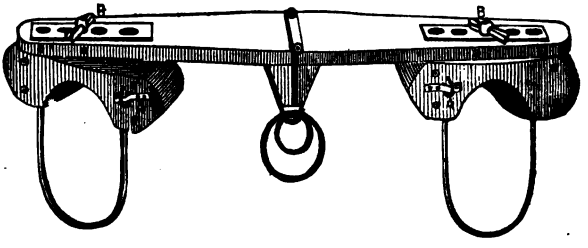
N. Y., have been remarkably successful in their manufacture of small and portable engines, suited to farm purposes. A Kentucky correspondent of the *Country Gentleman*, (J. A. HUMPHREYS,) who has one of Wood's eight-horse powers, has found it of great value, consuming four barrels of water and only a fourth of a cord of wood in a day. One person runs the engine, keeping up the fire, oiling the parts, and doing all else necessary, with great ease. It never gets out of order, and "works with the regularity and precision of a patent-lever watch." One-third of its power will cut up a four-horse load of straw in 22 minutes—it crushes and grinds for cattle food, thirty bushels of corn in the ear, per hour. It thrashes grain with great success. It is also to be used on a portable saw-mill.

An engine of 2½ horse power weighs 1500 lbs. and costs $225; a 4 horse power weighs 2000 lbs., costing $340; and an 8 horse engine weighs 4500 lbs. and costs $680. These engines are easily drawn (on trucks fitted to them) from one place to another, but are always stationary when in use. It will probably be a long time before any locomotive steam-power can be used for plowing, on account of the power lost in moving so heavy a body over a soft surface; and plowing with a stationary machine would be difficult from the great weight required for its firm and steady action. Some new mode of pulverizing the earth may be however devised, which shall be well adapted to the application of steam-power.

One great advantage of steam for farm purposes, is that no food is consumed when it is not working. Limited farmers will usually have enough spare horse-power at certain seasons to do their stationary work; but those who occupy hundreds of acres will doubtless find a great advantage in being able at any time to turn on an eight or ten horse force, for threshing, grinding, cutting straw, sawing wood, &c. &c.

VOSE'S OX YOKE.

In this yoke, the neck-blocks are separate from the beam, and are attached to it by strong bolts in iron sockets. The block thus turns with



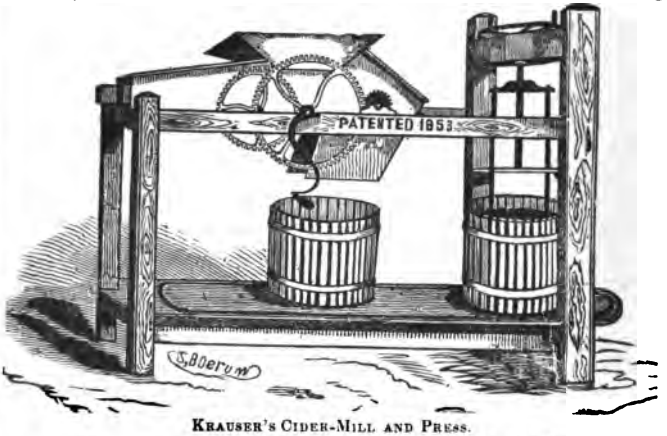
VOSE'S OX-YOKE

the animal's neck, and does not chafe. Both oxen always draw the same, if one falls behind the other, unless the bolt is varied from the center purposely in different holes, to favor a weak animal. The length of

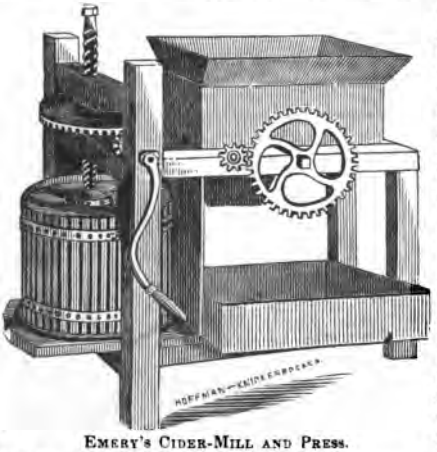
the yoke may be also thus varied, for different purposes. The bows are said to last much longer by the diminished side stress upon them. It is manufactured by Wm. Deering & Co., Albany, for $6.

CIDER MILLS FOR VINEGAR FACTORIES.

The manufacture of cider for conversion to vinegar and for culinary purposes, (for we cannot recommend it fermented to an intoxicating drink) is a desirable object, and as these purposes usually require but moderate quantities—from the less valuable apples of the orchard—small or portable machines have been recently contrived for this purpose.



KRAUSER'S CIDER-MILL AND PRESS.



EMERY'S CIDER-MILL AND PRESS.

One of these mills is KRAUSER'S, shown in the accompanying cut. The apples after being grated fine, fall into the vat beneath, and are then immediately transferred to the press shown at the end of the frame. It is said that two men with this machine will make 8 or 10 barrels of cider

in a day. It is much used and approved in eastern Pennsylvania, and is sold by R. H. Pease of Albany, for $40.

Hickok's, also a Pennsylvania mill, is a strong and compact machine, and said to be one of the best in use.

Emery's mill is a remarkably well made, neat and efficient one, and is especially valuable for the power of its press. It will grate with rapidity, and fine or coarse as desired. It may be worked by one or two men. Its weight is about three hundred pounds, and it is made for $45.

The great value of apples for feeding stock through winter, besides those intended for market as well as for baking, stewing, pies, &c., have very properly superseded the supposed necessity of converting them into hurtful drinks; and hand-mills, such as those now described, are sufficient for all ordinary purposes.

The improvement of farm machines and tools within the last fifty years has probably enabled the farmer to effect twice as much work with the same force of horses and men. Plows turn up the soil deeper, more evenly and perfectly, and with greater ease of draught; hoes and spades have become lighter and more efficient; grain, instead of being beaten out by the slow and laborious work of the flail, is now showered in torrents from the threshing machine; horse-rakes accomplish singly the work of many men using the old hand-rake; twelve to twenty acres of ripe grain are neatly cut in one day with a two-horse reaper; wheat drills, avoiding the tiresome drudgery of sowing by hand, are materially increasing the amount of the wheat crop; while a few farmers are making a large yearly saving by the application of horse-power to sawing wood, churning, driving washing-machines, and even to ditching. A celebrated English farmer has lately accomplished even more; for, by means of a steam-engine of six-horse power, he drives a pair of mill-stones for grinding feed, thrashes and cleans grain, elevates and bags it, pumps water for cattle, cuts straw, turns the grindstone, and drives liquid manure through pipes for irrigating his fields; and the waste steam cooks the food for his cattle and swine—all this work being performed in a first-rate manner.

Now these improvements were mainly effected through the knowledge of mechanical principles, and many of them would doubtless have been sooner achieved and better perfected if these principles had been well understood by farmers; for, constantly using the machines themselves, they could have perceived just what defects existed, and, by understanding the reasons of those defects, have been able to suggest the remedies in a better manner than the mere manufacturer. Moreover, as the introduction of what is new and valuable depends greatly upon the call for them, farmers would have been prepared to decide with more confidence and certainty upon their real merits, and thus to increase and cheapen the supply of the best, and to reject the worthless.

One great reason that farm implements are still so imperfect, is, that the farmers themselves do not fully understand what is needed, and how much may be yet accomplished. They have not enough knowledge of the principles of mechanics to qualify them for judging of the merits of new machines; and, being afraid of imposition, often reject what is really valuable, or else, being pleased with a fine appearance, are easily deceived with empty pretensions.

FRUIT CULTURE.

LAYING OUT AND PLANTING A FRUIT GARDEN.

THE frequent failure in attempts to raise good fruit, is mainly owing to a want of systematic and labor-saving culture. The owner of a piece of ground procures a few trees, and sticks them into the earth wherever he can find a vacant space, and without any previous preparation of the soil. The work is generally performed in quite a superficial manner. He is unwilling to incur the expense of digging very large holes and of filling them with enriching composted materials. The trees are mostly placed where they cannot be efficiently and economically cultivated, and, as an inevitable result, grass and weeds choke them, so that if they survive removal, they make but little growth for years, and when they bear, the fruit is small, imperfect, and deficient in flavor. The owner concludes that the flattering stories he has heard and read about delicious fruit, and the ease and rapidity with which it may be brought forward on young trees, are all chimera, and only invented to effect the sale of the trees by the nurseryman.

This treatment, and this result, in some modification or other, are far more frequent than the more favorable exceptions. No wonder, that in spite of the myriads of trees that are sold from the nurseries, there is still but little good fruit, and so few who are successful cultivators.

We can hardly expect our landowners generally to resort to the toil and cost of keeping all their trees in perfect order, by means of spading, hoeing, trenching, and other *hand* labor. And even when performed, it often but partially accomplishes its object, for small spaded circles, six or eight feet in diameter, do not extend their benefits sufficiently to the roots of trees which often spread over an area ten times the size—the roots being usually about as long as the stem and branches, and extending in every direction—so that a tree sixteen feet high probably throws the network of its roots over a circle two rods in diameter.

The only true way, therefore, for all who would have the very best of fruit, and obtain it economically, is to devote a lot of ground exclusively to fruit trees, and do all the work of preparing the ground and of its subsequent tillage, by horse labor.

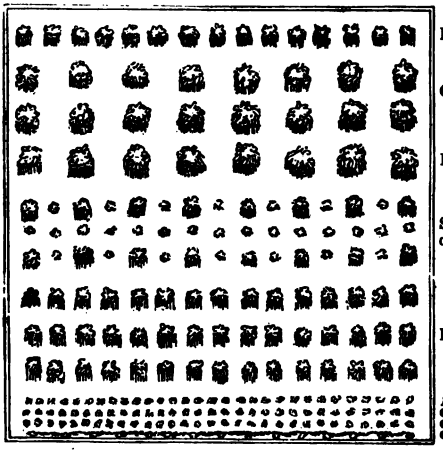
In selecting and setting apart such a lot, the first question that arises is, "how much ground need I devote to this purpose?"

To enable every one to answer this question understandingly, we furnish the accompanying plan of an *acre-fruit-garden*, showing the number and disposition of the trees of each kind. It is represented as a *square*, but may be varied in form to an oblong shape, only planting about the same number of trees in fewer or more rows, as the case may be. It is so arranged that although the trees are of different sizes and at different distances, the rows run both ways, and admit readily of horse-cultivation. The plums are placed in a row at one side, in order that pigs and poultry may be confined exclusively among them during

the season of the curculio, which proves one of the most efficient means for its destruction; and in connection with knocking on sheets, will afford good crops under any circumstances, if fully and efficiently applied. A movable or hurdle fence, separating the plums from the rest of the trees, renders the remedy many times more efficient than if these animals were allowed the whole range of the fruit garden. In some places, where the curculio is particularly destructive, cherries and early apples are also attacked; in which case, as these fruits are next to the plum row, all may be included in the pig-yard if desired.

Autumn and winter apples are not required in an enclosure of this kind, and the early sorts are placed here only to protect them from being stolen, besides the reason last named.

Pears may be planted with standards and dwarfs together in the same row, the dwarfs bearing and flourishing while the others are coming forward; or they may be placed in separate rows. The peaches, if in rows twenty feet apart, and twelve and a half feet in the row, will have quite enough room at any age, provided the long limbs are *thinned-in* from the outside every two or three years. With this care, apples may be planted much nearer than usual. None of the trees stand on exact squares; the importance of preserving straight rows for cultivation being greater than the form of the space occupied by each tree. When rows are wide apart, less room is needed in the rows.



PLAN OF FRUIT GARDEN.

By the arrangement we have here planned, the following trees may be planted on an acre, namely:

15 plum trees.....	1 row,	occupying	20	feet—	18	feet in the row.	
16 cherry trees.....	2 "	"	40	"	26	"	"
8 early apples.....	1 "	"	25	"	26	"	"
16 standard pears,	8 "	"	40	"	26	"	"
29 dwarf do					18	"	"

48 peach trees.....3 rows, occupying 60 feet—18 feet in the row.
45 raspberry.....1 " " 4 " 4 " "
45 gooseberry.....1 " " 4 " 4 " "
45 currant.....1 " " 4 " 4 " "
10 native grapes....1 " " 12 " 20 " "

In all 182 trees, besides the raspberries, currants, gooseberries and grapes.

As every cultivator would make a different selection, and as we have elsewhere given carefully made lists, it is hardly necessary to occupy space at present on this subject, except to remark that varieties *ripening in succession* should be sought, when a *family* supply is the object.

It may occur to some as an objection, that too much space is given to cherry trees. There will be, however, a decided advantage from the abundance of light and air for the trees, in diminishing the tendency to *rot* in the fruit, one of the most serious drawbacks in cherry culture. More room is given for the dwarf pear than usual, on account of proximity to the standards.

All kinds of trees may be made to conform in some degree to the room allotted to them by thinning in the exterior occasionally.

We should have stated before that each side of a square acre, is about 209 feet, and that the preceding measurements of distances will all come out in accordance with the plan.

There are many who would like a larger fruit garden. We accordingly give the following numbers and distances, the mode of arrangement being the same as in the preceding plan—and each side of the two-acre lot being 295 feet.

40 plums, nectarines and apricots, } 2 rows, occupying 40 feet, 15 feet in row.
40 cherries.....2 " " 50 " 15 "
10 early apples.....1 " " 30 " 30 "
40 standard pears.....2 " " 40 " 15 "
80 dwarf.....2 " " 20 " 7½ "
80 peaches.....4 " " 80 " 15 "
72 raspberries, 72 currants, 72 gooseberries, } .....3 " " 12 " 4 "
10 native grapes.....1 " " 10 " 20 "

Strawberry bed, 18 feet wide, 295 feet long.

The grapes are near the wall or fence, and having the strawberry bed and small bushes in front, are not shaded.

A full garden of this size, furnishes 290 trees, 10 grape vines on a trellis, and 216 raspberry, currant, and gooseberry bushes—with ample space for a strawberry bed, a portion of which should be prepared each year for planting new, say four feet wide, which will leave 8 feet for bearing beds, and give new plantations every third year.

Having now stated the size and contents of the fruit garden, which may be freely varied at pleasure, the next thing is to prepare the ground.

In the first place, there are but very few pieces of land that are not benefitted by underdraining; and as an almost universal rule, wherever the water will stand in a post-hole, dug in the wettest season of the year, underdraining should be thoroughly performed before planting trees. Ditches, at least two and a half feet deep, should run down the

slope in the steepest direction, and unless the soil is very porous, be not more than two rods apart each. If fitted with tile, which is best, or stone, which is next best, or with brush from cedar, pitch-pine, white-oak, locust, &c., which will answer a good purpose when but little water is to drain off, the roots of the trees will have an excellent chance to extend themselves without being drowned in stagnant water at wet times, and which is a frightful source of stunted and diseased trees, and bad and scabby fruit.

Next, the soil should be subsoiled and trench-plowed several times, accompanied with repeated applications of manure, (except on the richest natural soils,) until all is thoroughly worked together to a good depth. If this could be done six months or a year before the trees are planted, so that all may become well diffused together, it would be best, but it is by no means essential, provided the harrow is thoroughly and repeatedly used in breaking and mixing the manure with the earth.

The trees are then planted as already designated; *and then comes the most important operation of all*, namely, keeping the whole surface clear and mellow among the trees, *as long as they are expected to bear good fruit*. When the trees are quite young, two or three rows of carrots, potatoes, beans, or turnips, may be raised between the more remote rows, *but never within six feet of any tree;* for the roots of even very young trees extend three or four feet, and the fine roots of the crops already named, several feet besides, and they soon interfere with each other, and retard the trees. After the trees become a few years of age, it is best to keep *the whole surface perfectly clean and mellow*, by the plow, harrow and cultivator, using the two latter nearest the roots. As the rows may be worked both ways, it will be much easier to keep such a garden as this clean, than an equal area of corn or potatoes, because the trees are less frequent than the hills of corn and potatoes. A very few dollars annually will be the entire cost of cultivation.

The rapid growth made by such a cultivation, on so well prepared and well cultivated a piece of ground, as compared with that made in ordinary cases, will be absolutely astonishing. Not less so will be the quickness with which many trees will begin to supply crops of fruit, as well as the high quality, great size, beautiful appearance, and heavy crops of that fruit.

There are some instances where the high cultivation given to the soil must not be continued after mid-summer. This is more especially the case with the *pear*, which, if continuing to grow late in the season, is subject to the malady known as the *frozen-sap blight*. If therefore, cultivation is suspended early, the thrifty shoots will ripen their wood in time, and the hardiness and vigor of the tree will exceed such as have had no thrifty growth at all. The same treatment to some extent, should be given to the peach tree.

The cost of preparing and cultivating an acre of land, as we have proposed, will be almost incomparably less than where all is done by hand. The following will approach a correct estimate:

Underdraining an acre of land, at intervals two rods apart..	$25 00
Subsoiling twice, trench plowing four times, and harrowing 25 times.....	22 00
100 loads manure, and drawing, say.....	50 00
	$97 00

This expenditure will probably be returned, as an average, at least every year, in the increased value of the crop, after the first five years of growth.

The annual expense of cultivating such a fruit garden, would be about as follows:

Plowing once in spring to break up the settled earth	$2 00
Cultivating with horse, or harrowing six times	8 00
Whole annual cost	$5 00

LAYING OUT ORCHARDS.

We have often observed a good deal of inconvenience and perplexity in measuring off and laying out orchards, from a want of accuracy at the commencement. If the rows are begun crooked, stake after stake may be altered, without being able to form straight lines, and with only an increase of the confusion. If the first tree, in a row of fifty, be placed only six inches out of the way, and be followed as a guide for the rest, the last one will deviate fifty times six inches, or twenty-five feet from a right line; even if the first error is not repeated. We have seen large apple orchards with rows nearly as crooked as this. To say nothing of the deformed appearance to the eye, they prove exceedingly inconvenient every time the crooked space between the rows was plowed, and every time the ground was planted and cultivated with crops in rows.

FIG. 1—COMMON OR SQUARE ARRANGEMENT.

The most simple and convenient arrangement for orchards in all ordinary cases, is in squares, as shown in fig. 1. But planters are often puzzled to know how to lay out such orchards with trees at equal distances throughout, and in perfectly straight rows. The easiest and most successful mode is first to measure off one side along the boundary, with a chain or tape-line (a chain is best,) and drive in a stake perpendicularly at equal distances, (say two rods or 33 feet,) *in a straight line*, and at a proper distance from the fence for the first row of trees. Then measure off each end in the same way; and between the two last stakes in these end rows, form another line of stakes like the first, which will be parallel and opposite to it. The more accurately the measuring is done, the less labor will be required in rectifying small errors—no stake should stand half an inch out of a straight line. These rows are represented by the letters a, b, c, d, e, f, g, h, i. Then measure off the distance between a and a, driving in a small stake or peg at each distance of two

rods; and then in the same way between b b, c c, &c. If accurately done, these will all form perfectly straight rows. The holes may then be dug without the least difficulty or embarrassment, and the trees set out. But a difficulty arises,—as the stakes must be removed in digging the holes; this is at once obviated by the plan here proposed, by placing the tree in a line with the row of stakes on one side, and with the newly set trees on the other, as the holes are successively dug, and the trees set.

These directions may seem quite simple, but for want of being generally understood, a great many crooked lines of trees are seen through the country.

The second mode of arranging trees is in the old *quincunx* form (fig. 2) which is nothing more than a series of squares laid off diagonally, and has no special advantage to recommend it except novelty.

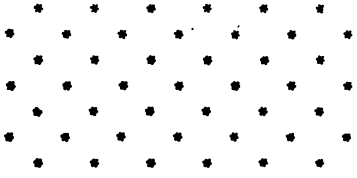


Fig. 2—Old Quincunx Order.

The *hexagonal or modern quincunx*, (fig. 3) possesses two important advantages. One is its more picturesque appearance, and its consequent fitness for proximity to ornamental plantations; and the other is its

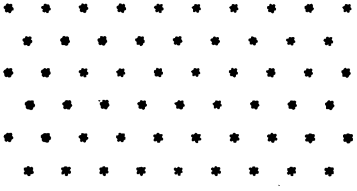


Fig 3—Hexagonal or Modern Quincunx.

greater economy of space, as the trees are more evenly distributed over the ground. This is shown in fig. 4, where each tree stands in the center of a circle surrounded at equal distances by six other trees, and each single circle leaves but little vacant space beyond it. If cultivated with horses, the furrows may be drawn in three different directions, instead of only two as in the square arrangement.

One principal reason why the hexagonal mode is so little adopted, is the supposed difficulty in laying out the ground. But like many other apparent difficulties, it becomes very simple and easy when once understood.

To lay off a piece of ground for this purpose, measure off one side of the field at equal distances, as already described for squares, as at a, b, c, d, e, fig. 4. These distances must be the distance apart at which the trees are to stand, because they form the sides of the equilateral triangles into which the whole ground becomes divided. The next thing is

to find the distances, a, f, g, for the line of trees at right angles to the first mentioned row. An arithmetician will easily determine this, for the triangle b a f, being a *right* one, the square of b a (which is 33 feet,)

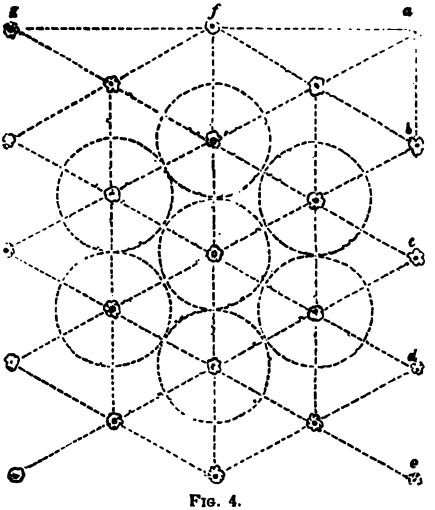


FIG. 4.

subtracted from the square of b f (which is 66 feet) will leave the square of a f, the root of which extracted will give the distances a f, f g, &c., which is 57 feet and half an inch. Divide this and the opposite side of the field, therefore, into distances of 57 feet and half an inch, and the side opposite the first, at 33 feet distances, and proceed to stake off all intermediate intersections, as described for squares. If the distances are less than 33 feet, as they would be for any other kind of fruit trees, a corresponding proportion is of course to be taken, and which is easily determined as above.

MULCHING AND DEEP PLANTING.

A common rule, in directions for transplanting trees, is to place them at the same depth as they stood before removal. But the *reasons* are not always well understood. The chief difficulty that occurs from deep planting, (fig. 1) is from placing the roots so far down that they must enter the hard cold subsoil, and become subjected to a degree of wetness to which the upper soil is not incident.

The opposite extreme, or shallow planting, is much better, provided the roots are well covered, even if a considerable mound is raised, (fig. 2,) for in this instance, the roots have an opportunity of extending through the richer, drier and warmer top soil, made deeper by this ad-

dition to the surface. The advantages of *mulching* are thus obtained, which owes much of its efficacy to the facility it offers for roots to draw nourishment from the upper soil. But as roots quickly extend over much breadth of surface, the mound must be wide, and not as is too often the case, a mere hillock at the foot of the stem, as is seen in fig. 8.

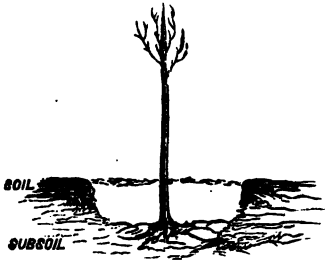


FIG. 1.

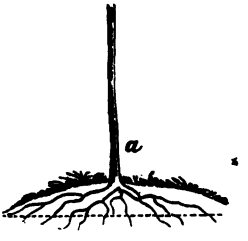


FIG. 2.

A mistaken notion and consequent error in practice commonly prevails, in relation to the *length* of the roots of young trees. The writer has found that manure placed at a distance of eight feet from young peach trees, which were scarcely eight feet high, very sensibly affected them. more than doubling the growth of the shoots. We may hence in-

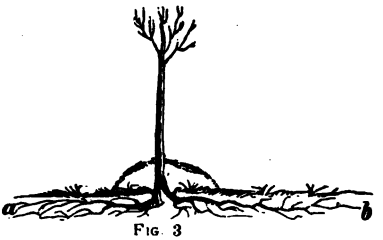


FIG. 3

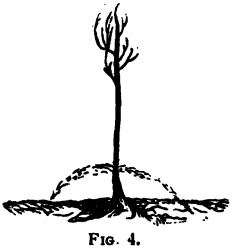


FIG. 4.

fer that roots extend, on an average, to a distance equal to the height of the tree; that is, a tree ten feet high, has a circle of roots about twenty feet in diameter. Hence, manuring or mulching such a tree as is shown in fig. 3, with the circumscribed heap at the foot of the trunk, while the roots actually extend from *a* to *b*, is a total failure. Banking up such a tree to exclude mice (a perfectly effectual remedy) is, on the contrary, attended with no injurious effect whatever, other than what may be exerted on the bark of the stem, as the great mass of the roots remain precisely at the same depth as before. A neighbor who intended to apply his ashes to his large bearing apple orchard, innocently inquired "how large a *heap* he should place at the foot of each tree," and was quite surprised when informed that if he expected the roots to receive the benefit, the ashes should be sown broadcast or nearly so; and nothing is more common than similar misapprehensions of practice

DWARF PEAR TREES.

A controversy has arisen on the value of dwarf pears, or pears budded on the French quince stock, and kept in the form of small trees. Some persons regard them as short lived and unprofitable, and unworthy of general cultivation; while others prefer them to pears on pear roots.

There are several reasons for this difference of opinion, but the chief one is the too common practice of classing the two kinds of trees and their management together, without discrimination.—Dwarfs are *garden* trees, needing high culture, generous manuring, and judicious pruning; there are but few sorts of the pear that fully succeed on quince stocks; and the indiscriminate working of so many sorts as dwarfs, and an entire neglect of their proper cultivation, has resulted in frequent failure and disbelief in their success. Properly selected and managed, pears grown as dwarfs come soon into bearing, the fruit is easily gathered, they require little room,

and will continue to flourish for many years. The following varieties have been proved by long trial to succeed well on the quince:—*Duchess of Angouleme, Louise Bonne of Jersey, Vicar of Winkfield, Beurre Diel, Easter Beurre, Glout Morceau, White Doyenne, Beurre d'Amalis,* and *Buffum.* There are several other sorts that promise well so far, among which are *Osband's Summer, Tyson, Stevens' Genesee, Rostiezer, Brandywine, Dearborn's Seedling,* &c.

The accompanying engraving is an exact portrait of a dwarf tree of the Angouleme pear, standing on the grounds of J. J. Smith, of Philadelphia, (editor of the *Horticulturist,*) as it appeared last autumn when loaded with fruit. It was set out four years before with several others now bearing equally well, and of the same age, and was then one year from the bud.

NOTES ON FRUIT CULTURE.

Inconsistencies in Cultivation.—The disposition, habit, fashion, or other cause of neglecting the culture of fruit trees, is so common, that we fear it will be a long time before the evil is thoroughly reformed. There seems to be a very common determination to give them the *last chance,* of all cultivated crops. A row of *currants,* for example, is planted in a garden; it will indeed bear well with neglect; but an annual manuring and thinning out of old wood, would at least triple the size of the fruit, and improve its quality. The row of currants will furnish a daily supply of refreshing fruit to the table for months together; why should its culture then be totally neglected, when a row of corn by its side of equal length, that will supply only a single feeding to a pen of swine, is most carefully manured, watched, plowed and hoed? We have not unfrequently seen farmers, who after expending a quarter of a dollar each on a young orchard of trees and in carefully setting them out, would destroy one half by choking them with a crop of oats or clover, because they could not *afford* to lose the use of the small strip of land a few feet wide in the row, which ought to have been kept clean and cultivated. The same men would regard it as insanity to plant corn among the grass of a meadow, or in a field of oats, although the planting would not cost a hundredth part of the value of the young trees. In other cases, farmers may be seen driving their teams and plows directly over a young fifty-cent tree, tearing its bark and risking its life, in order to avoid running over an adjacent potato-hill, not worth three mills currency.

There seems to be two or three causes for this strange behavior. One is, habit, or doing so because others do. Another, is a sort of indefinite notion that trees will take care of themselves. A third is an almost total want of appreciation of the real value of trees. A volume might be written on the subject; but we can only add here in a few words, that no growing plant feels more the life-giving influence of good cultivation than young trees—the difference between good treatment and neglect often being as great as *twenty to one,* as shown by the actual measurement of the growth. A single acre of well chosen trees has produced fruit for a regular family supply for months together, that has saved in provisions, to say nothing of increased health, at least ten times as much as some

would raise from the same acre in ordinary farm crops; and we could cite several cases where a five or six acre orchard has brought a larger return of money than all other sales from a hundred acre farm.

ISABELLA GRAPES IN VERMONT.—The following facts are condensed from Proceedings of the Massachusetts Horticultural Society:

E. C. TRACY, of Windsor, Vt., (a cold region, about 60 miles further north than Albany,) presented Isabella grapes, the *bunches* of which were of "extra size," and the *berries* "of so remarkable a size" as to receive the Society's silver medal. According to the statement furnished relative to their management, it appears that the vine stands in a very exposed situation, and runs on a trellis—is kept well cut back, well manured, and well watered with soap suds, while the grapes are swelling. When the buds are breaking in spring, they are thinned to one at a joint; and when the fruit buds appear, all are rubbed off but one or two to a shoot. When the fruit is the size of a large pea, the shoots are girdled just below the clusters by removing half an inch in length of bark,—taking care not to injure the bud at the base of the shoot for next year. It has been found impossible to ripen a crop of exposed Isabellas there, without this girdling.

PYRAMIDAL TRAINING OF GRAPES.—C. A. BRACKETT, of Winchester, who has uniformly exhibited the finest specimens of the Diana grape, trains them each to a stake, and gives them the pyramidal form. The soil is first trenched two feet deep, and stakes eight feet high are set seven feet apart, a vine planted at each and immediately cut down to two eyes. The first year two shoots are allowed to grow, and are carried up spirally, both in the same direction, about five inches apart, around the stake, till they reach the top. The laterals grow at random. They are pruned back in the fall to eighteen inches, and the laterals to one eye. The second year, two shoots are carried up as before, from the two upper eyes, the laterals requiring summer pruning. In the fall, the vines are cut back to within eighteen inches of last year's wood. This course is continued till the vine permanently covers the whole of the stake or post—whatever surmounts it is cut back. The fruit is borne on the side shoots, the pruning is done on the short-spur system, and a handsome pyramidal form is given to the whole.

By this system the vine is kept *at home*, light and air have easy access, the buds break easily, the flow of sap is equal and natural, and when once established the vine requires comparatively little care.

Little or no manure is used—a few feet of short-jointed wood being preferred to a longer growth from a heavy use of animal matters—doubtless different soils require different treatment in this respect. The Diana, thus treated, has proved "a great grower and free-bearer—the bunches of good size, and the berries large, some of them measuring *seven-eighths of an inch in diameter.*"

PEARS ON APPLE-STOCKS.—It is very rare that pears succeed well on apple stocks. Sometimes they will give much promise for a year or two, and then fail. The Winkfield and Summer Bonchretien, will often grow freely for a few years. We have raised about one peck of fine Seckel pears on a small tree on apple root, five years old, but the union being imperfect, it broke off at the surface of the ground. We cannot recommend the practice, except to those who are fond of unsuccessful ex-

periments, often not one in a hundred succeeding after the first year or two.

GREAT PROFITS OF PEAR TREES.—The following instances of the large profits of raising pears are from the Proceedings of the Fruit Growers' Society of Western New-York, and are not to be regarded as unusual or extraordinary instances or not easily attained, for in most of the instances little or no cultivation was given:

Mrs. George, of Victor, sold $24 worth of White Doyenne Pears from one tree eighteen years old, on the tree; the buyer picked them.

Marshall Phinley, of Canandaigua, has three White Doyennne Pear trees, one quite small; sells the pears on the tree for from $50 to $60 yearly; has been offered $100 per tree for the trees; they are constant bearers.

There is a tree of this variety on Judge Howell's homestead, about seventy years old, which has not failed of a good crop for forty years, and has averaged about twenty bushels a year for the last twenty years, which have been sold on the tree at the average of $3 per bushel, or $60 a year. This tree has been worth, or produced about $3,750 worth of pears, in the New-York market.

Judge Taylor has three large trees of this splendid pear, of about the same age; yield in 1854, eleven barrels; sold for $137.

T. Chapin has a young orchard of this variety, of about 400 trees, some eight years from planting; he sold thirty barrels in New-York in the fall of 1853, for $15 a barrel—$450. In 1854, his crop amounted to fifty barrels, which he sold in New-York for from $18 to $22 a barrel; average, $20, equal to $1000.

This year he lost a portion of his crop by the pears dropping, caused by planting corn in his orchard close to his trees, and which was a very heavy crop. All the White Doyenne trees about Canandaigua produce in about the same proportion.

Soil, deep, dark clay vegetable mould, sub-soil clay; trees sound and healthy.

GRAFTING THE PEACH.—This, in the northern states, requires great skill for its successful performance, but at the south where growth is so much more rapid, and other influences more favorable, it is comparatively easy. In a late letter from ROBERT HARWELL, of Mobile, long known for his skill in fruit culture at that place, he gives the following results of his practice: "I propagate all my peaches by grafting, beginning in November or December, and if the stocks and grafts are good and the grafting well done, I do not lose over *five* in a hundred. I have my grafting done at the house, and plant the grafts like cabbage plants. I formerly budded, but found it very troublesome, and have entirely abandoned it."

THE USE OF LEAVES.—The office and utility of leaves are becoming better understood by cultivators than formerly; yet we find a good many still adhering to the old belief that the sun's rays directly shining on forming fruit, are what perfect it, independently of other influences.

On this subject, theory and practice have been invariably found in perfect accordance with each other. The principles of physiology teach us that the sap of a tree, when it passes in at the roots, remains nearly unchanged in its upward progress through stem and branches, until it reach-

es the LEAVES, where being spread out in those thin organs, to light and air, it undergoes a complete change, and thus becomes suited to the formation of new wood and new fruit. Strip a rapidly growing tree of its leaves at midsummer, and from that moment the supply of new wood ceases, and it will grow no more till new leaves are formed; and if it have young fruit, the growth and maturity of the latter will cease in the same way. A few years since, a Yellow Gage plum tree lost all its foliage from leaf blight, when the plums were not fully grown, and while yet destitute of flavor. The fruit remained stationary and unaltered, until, in a few weeks, a second crop of leaves came out. They then swelled to full size, received their crimson dots, and assumed their honied sweetness of flavor.

The object of pruning should be, therefore, to allow THE LEAVES to grow to full size without being injured from crowding.

We find the following corroboratlve fact stated in a late number of the New-England Farmer:

We once knew an intelligent lady, and one who understood much about horticulture, strip her grape vines of a portion of their leaves, in order *to let in the sun and ripen* the fruit; but to her surprise, where the leaves remained as Nature had disposed them, the grapes were the earliest, and every way the best. This led her to investigate the matter, when she was delighted to learn that the leaves were not only the *protectors*, but the *caterers* of the fruit, constantly elaborating and supplying it with the pabulum it required to bring it to perfection.

HARDY PEARS FOR THE NORTH.—Seckel, Flemish Beauty, Giffard, Virgalieu, Sheldon, Lawrence, Winter Nelis; *on pear stocks*. Louise Bonne Jersey, Tyson, Angouleme, Winkfield, Osband's Summer, Glout Morceau, *on quince*.

APPLES FOR COLD REGIONS.—Red Astrachan, Sops of Wine, Early Joe, Gravenstein, Oldenburgh, Porter, St. Lawrence, Fameuse, Ribston Pippin, Baldwin, Jonathan, Peck's Pleasant, Pomme Grise.

APPLES FOR MICHIGAN.—At the recent meeting of the Michigan Fruit Grower's Association, the following apples were recommended for general cultivation in that state, viz: Swaar, Rambo, Yellow Bellflower, Esopus Spitzenburgh, Rhode Island Greening and Belmont or Waxen. The Baldwin, although found to be variable, and often badly affected with dry rot, was on account of its many excellent qualities, also similarly recommended.

PEARS.—At the same convention, the following pears were recommended for general cultivation: Glout Morceau, Flemish Beauty (for light soils,) Stevens' Genesee, Dearborn's Seedling, Swan's Orange (Onondaga,) and English Jargonelle. The latter must be picked and house ripened, or it rots at the core and becomes worthless.

SELECT FRUITS FOR TENNESSEE ANE OTHER SOUTH-WESTERN STATES.—The best native *grapes* (for open culture,) in Tennessee, are Catawba and Isabella. Of the exotics, (needing a glass covering,) Early Black July is the earliest; and Black Hamburgh, Royal Muscadine, and Muscat of Alexandria, the best. There are several other foreign grapes, nearly as good as these, and having peculiar excellencies—for an account of which see works on pomology.

Peaches—Early York, Crawford's Early, Oldmixon Freestone.
Plums—Lawrence Gage, Jefferson, Coe's Golden Drop.
Pears—Bartlett, Seckel, White Doyenne.
Cherries—Early Purple Guigne, Governor Wood, Downer's Late.
Apples—Early Harvest and Sweet Bough for summer; Gravenstein and Fall Pippin for autumn; and Newtown Pippin, Pryor's Red, and Rawle's Janet, for winter.
Strawberries—for ordinary culture, and the most reliable for crops,—Cincinnati, Hudson. Sometimes very fine—Hovey's Seedling and Burr's New Pine. New sorts, promising well, Jenney's Seedling and McAvoy's Superior.

EARLY BEARERS.—The following varieties of apples and pears come early into bearing, and are therefore well adapted to planting a new place.
Apples—Red Astrachan, Sops of Wine, Late Strawberry, Lowell, Oldenburgh, Dyer, Porter, Baldwin, Jonathan.
Pears—Julienne (takes the lead for early bearing, of all others,) Bartlett, Washington, Dearborn's Seedling, Madeleine, Buffum, Onondaga, Howell, Summer Doyenne, Oswego Beurre, Passe Colmar, Easter Beurre.

MANURES FOR FRUIT TREES.—The best manures for fruit trees, under usual circumstances, are composts made of stable manure, turf, muck, or loam, with a small quantity of ashes, and still less lime. The addition of guano, bone manure, &c., increase its value. The proportions may be one-third yard manure, over one-third turf, loam, or peat, and a tenth ashes, a twentieth guano or bone manure. The special manures applied separately, *sometimes* produce decided results, but not usually.

FRUIT VERSUS DISEASE.—In a recent conversation with an intelligent person who has made long-continued and extensive observations on climate and disease, we were assured that nothing had a more beneficial influence in preventing intermittents and the other effects of malaria, than a moderate and regular use of wholesome, well ripened fruit. Our own limited observations abundantly confirm this opinion. This being the case, what millions in losses, to say nothing of the untold discomforts and suffering experienced by the settlers of the great West, might thus be prevented or mitigated. Our western emigrants could carry no better medicine chest with them than a box well packed with a well selected assortment of early bearing fruit trees. Dwarf pears for instance, often bear even the first year, and sometimes produce abundantly in the course of the first two or three seasons; we have known a peach tree to yield three pecks the third summer. The smaller kinds, such as strawberries, raspberries, gooseberries and currants, afford a quick return of very wholesome fruit. A little attention and care of this kind in connection with a moderate share of information and intelligence, would doubtless prevent many serious losses, and avert a vast amount of positive suffering during the first few years of frontier life, when a sufficient degree of privation and inconvenience is often experienced, even with the blessing of uninterrupted health.

GAS TAR FOR INSECTS.—HUMPHREY HOWLAND, of Aurora, N. Y. has found gas tar the most efficient agent for destroying the common orchard caterpiller. It is applied by means of a swab on a pole, and so powerful are its effects, that the slightest touch the insects receive from the pungent and corrosive liquid, kills them instantly.

A PRODUCTIVE TREE.—A. LOOMIS, of Byron, Genesee county, N. Y., says that the past season, a tree of the Baldwin apple, standing on the ground of his brother, produced last year twelve barrels (besides four or five bushels of windfalls,) that sold for $2.25 per barrel. The year's product of this tree was consequently *twenty-seven dollars*—quite equal to an acre of wheat in net profit.

TO PREVENT FRUIT TREES FROM SPLITTING.—For preventing forked trees from splitting under their weight of fruit, Isaac Lewis of Hopkinsville, Ky., has given the *Prairie Farmer* his plan. "My plan," he writes, "which I have followed for thirty years, is this: when I find a forked tree that is likely to split, I look for a small limb on each fork, and clean them of leaves and lateral branches for most of their length. I then carefully bring them together and wind them round each other, from one main branch to the other. In twelve months they will have united, and in two years the ends can be cut off. The brace will grow as fast as any other part of the tree, and is a perfect security from splitting. I have them now of all sizes, and I scarcely ever knew one to fail to grow."

KEEPING APPLES.—S. S. Boyd of Jacksonburgh, Indiana, states that he has found apples to decay in keeping, more from being kept too close and warm, than from all other causes put together. He has succeeded remarkably with a cellar where the air circulates freely, and is so cool that potatoes cannot be kept there. Close or confined air we have long since found to be detrimental, and we have therefore adopted the plan of suspending the apple shelves in the middle of the cellar, so that one can pass round on every side, which is the most convenient; and so as to admit a free circulation of air, which cannot take place when the shelves are in contact with the damp walls. Iron rods are best for supporting them, and if sufficient space is allowed, rats and mice cannot reach them.

COST AND PROFITS OF AN APPLE ORCHARD.—A. Preble, of Lincoln Co., Maine, makes the following estimate, which will be nearly correct in all good apple regions, allowing for some variation in prices: One hundred trees planted on an acre of land will cost, on an average, $25. The land should be kept in a state of cultivation whilst the trees are coming into bearing. About $25 expended in care and labor, besides the crops taken from the land, will bring them into a bearing state. When an acre of trees is in its prime, it will average 400 bushels per annum, provided the land is kept rich and loose, and the trees well managed. Average price, 66 cents per bushel. Our surplus apples are valuable for all kinds of stock, particularly to winter store-hogs. Sweet apples are worth about as much as potatoes.

GOOD CULTURE.—Henry Little of Bangor, Maine, justly observes: I see no reason why we should manure our lands for crops of wheat, corn and potatoes, and utterly neglect to enrich the soil for our crops of fruit. One of our farmers was asked why his apples were so much superior to those of the same variety raised by his neighbor? "Because," he replied, "I *fat* my apples—by enriching the soil around the roots of my trees." There may be a few instances at the west where the soil is already rich enough for grain and root as well as for fruit crops, but the reverse is often strikingly the case in other places.

CULTURE OF THE RASPBERRY.

The Raspberry has much to recommend its culture. Immediately succeeding the Strawberry, and coming in before the larger fruits, it occupies a time when there is little else to be had; it is more conveniently gathered than the strawberry; and the plants not being large enough to shade other crops in the kitchen garden, they may be set on the line of any subdivision of the grounds. It is eminently a wholesome fruit, and sometimes proves a valuable medicine from its expectorant qualities, which the writer proved to advantage in his own case, for whom it was recommended by high medical authority, and it was found not at all repulsive to take, even in quite large doses.

Propagation.—Most varieties increase rapidly by suckers—a few, as the American Black and White, root readily from layers, the tips of the recurved shoots being buried; and nearly all sorts may be propagated rapidly by cutting the roots into small pieces, and starting them with bottom heat. New varieties, raised from seed by crossing, often bear the second year.

Soil.—The soil should be rich, and inclining to moist. A strong, deep loam, is the only soil from which a full crop may be expected every season. But the most important requisite is *depth*, attained by deep trenching, which will go far towards affording a remedy for the natural defects of a stiff clay on one hand, and a dry gravelly or sandy soil on the other. *Irrigation* has doubled the size of the berries in a few days, and more than doubled the growth of the stems in a season,—showing the great importance of securing moisture for the roots, by a *deep, mellow* soil, and by *mulching*. The latter has been found of great importance and has greatly increased the crop The tender sorts will ripen wood more perfectly, and endure cold with less injury if planted on the drier and firmer spots of ground.

Pruning.—This consists simply in cutting away, early in spring, all the last year's bearing canes, now two years old, and leaving only the one year's shoots, which will bear the coming summer. Half a dozen of the strongest in each bunch will be enough, and the rest may be cut away at the surface by the use of a sharp trowel. The tops are then cut off three or four feet from the ground.

Training.—The most common and simple mode is to tie the canes to-

Fig. 1.

Fig. 2

gether, loosely, so that they may spread at the top in the form of a wine-glass, and employing a stake to stiffen them, fig. 1. An improvement on the same principle, is made by stretching a wire along the row, spreading out the canes in contact with the wire, and securing them by cord loops, as shown in fig. 2. Another mode is shown in fig. 3, the two-year bearing-canes, being bent over in the form of an arch and tied to stakes,

while the present year's shoots grow upright, to be bent down in the same way the following spring, after the old bearing canes are cut away.

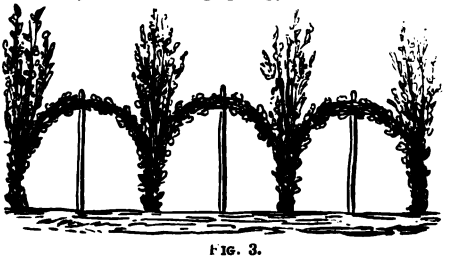


FIG. 3.

Fig. 4 shows the appearance in spring after the pruning has been performed and before the new shoots have sprung up. By this mode the bearing canes are separated from the others, and have more light and air. Instead of a row of stakes, as in this mode, (the *end* of each row being towards us,) a wire may be stretched as indicated by fig. 2, the arched shoots meeting both ways at this wire. But this arrangement requires that the canes should be spread thinly out, or the light will not reach the fruit growing beneath. A decided improvement, with the same principle, is shown in fig. 5, where *two* poles or wires are placed one each side of the row of plants, the bearing and the growing shoots being separated from each other, and tied to opposite sides Fig. 6 shows the mode by which these shoots are attached by a cord. A tarred rope is better than wire, by enabling the operator to secure the shoots more firmly without danger of subsequent sliding.

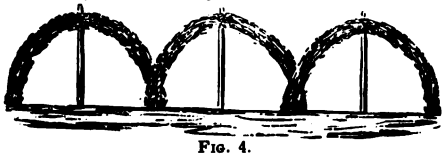


FIG. 4.

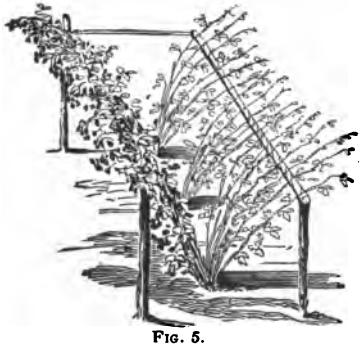


FIG. 5.

Tender varieties may be protected by prostrating them and covering thinly with earth. Even when not so tender as to be killed, this protection assists their productiveness. A small earth mound should be placed against each stem to bend upon and prevent breaking.

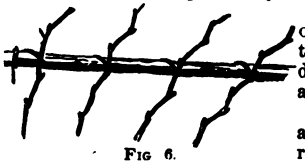


FIG 6.

For extensive marketing, plantations of raspberries prove quite profitable on the best soils, producing about five hundred dollars per acre in each year, when accessible to good city markets.

The best varieties of the Raspberry are the *Red Antwerp*, a large, dark red, rich and juicy berry, admirably fitted for

TRUE RED ANTWERP.

marketing; the *Fastolff*, resembling the Red Antwerp, but richer and softer in texture; the *Franconia*, quite similar, but later, of firm flesh, and is rather hardier than either of the others; *Knevett's Giant*, very large, and of fine quality; *Yellow Antwerp*, large, conical, excellent, but tender, and a moderate bearer; *Col. Wilder*, resembling the latter, but with smaller berries, and much hardier stems; *Large Fruited Monthly*, large, red, bears late and valuable; and *Brinckle's Orange*, regarded by many as the best of all Raspberries, vigorous, hardy, productive, handsome and excellent.

THE BLACKBERRY requires nearly the same treatment as the Raspberry, but as it is a more rampant grower, it needs particular care in keeping it clear of suckers, and in shortening in the stems to promote fruitfulness. It should not be allowed to grow more than three or four feet high for bearing.

FASTOLFF.

The best varieties are the *High Bush* and *New Rochelle*. The former are oblong, and often measure an inch and a half long. The latter is becoming a general favorite, being very large, more nearly round, and exceedingly productive.

The New Rochelle Blackberry, of which, according to Charles Downing, "a dozen or so in full bearing, will give fruit sufficient for an ordinary family for some six weeks," requires good cultivation and management. The

COL. WILDER.

KNEEVET'S GIANT.

following directions, founded on experience, are copied from the Horticulturist, from GEO. SEYMOUR & Co.:

"We prepare the ground by plowing and manuring as for any ordinary crop. We then take young plants, cut them back to within six inches of the roots, and plant in rows eight feet by four apart. The first season we use the plow and cultivator both ways between the rows, keeping the ground in good tilth. Next, or the second season, we train the plants into the four feet spaces, leaving the eight feet spaces for the plow and cultivator to work in. When the plants are five or six feet high, pinch out the leading shoot to induce the growth of vigorous side branches. In training, we prefer the bending mode to the upright.

"We regard this Blackberry as a very valuable addition to the list of small fruits, because

HIGH BUSH BLACKBERRY.

it is so simple in its cultivation, bears regular and abundant crops, and when perfectly ripe is of a highly agreeable flavor."

"We have only to add," says P BARRY, the editor, "that from what we have seen and heard of this fruit, it cannot fail to be an object of very profitable culture within any reasonable distance of large cities. It ripens after Strawberries and Raspberries, and before Peaches, and therefore comes most opportunely as to season. And then its cultivation must be of the easiest possible kind—only give it rich soil, and keep it clean and well cultivated, and an abundance of large fruit is certain. No one need expect such wondrous large fruit, however, as people have witnessed at New Rochelle and Norwalk, in ordinary soil and with ordinary culture. Manure must be applied unsparingly, and the ground must be kept clean and friable as work can make it. *Rich soil and clean culture* are indispensable to the growth of large fruits of any kind."

NEW ROCHELLE BLACKBERRY.

ORNAMENTAL PLANTING AND PLANTS.

CONTINUING the subject of ornamental planting, from former numbers of the Register, we shall here point out more particularly some of the newer or rarer trees and flowering plants which may be employed for decorating the grounds and windows of dwellings, with hints for their treatment. The eminent utility of increasing the attractions of home by the use of these beautiful natural objects, and the great economy of this mode of decoration, when compared with expenditure for costly architecture, have been already pointed out.

HALF-HARDY TREES.—Some of the most interesting ornamental trees, being natives of warmer regions than the Northern States, require more management than a maple or an apple tree. With proper treatment they may be made to grow in the open air, when under other circumstances they would perish.

The *Paulownia* is one of the finest of the newly introduced trees, but is often much cut down by winter frost at the north. If growing on rich, moist soils, its shoots become large and succulent, and are easily injured. On a deep, dry soil, and a *dry sub-soil*, possessing but moderate fertility, or rather sterile, its growth is slower, and the wood becomes harder and better ripened, and fitted to withstand the cold of severe winters. By transplanting into a deep artificial bed of stones, gravel and soil, that shall always be dry, it might be successfully raised in nearly every part of the north. Even the Catalpa, which is a hardier tree than the Paulownia, is much influenced by these causes. In one instance, in a clayey region of country, a tree planted in the deep loose bed of sterile earth formed by excavating a cellar, grew and flourished for thirty years, its present

PAULOWNIA IMPERIALIS.

age; while another similar tree set in the ordinary soil, did not survive three years.

Tender Evergreens require different management. The great cause of injury to these is exposure to the *sun's rays* after severe freezing. Hence protection must be mainly looked for by shelter from the sun, either under the north side of buildings, or under the shade of hardier and larger evergreen trees. The *Deodar*, the *Cedar of Lebanon*, and even the *Araucaria*, may be inured to open exposure by these precautions.

CEDAR OF LEBANON, growing on the grounds of T. Ash, Throg's Neck, N.Y.

The Cedar of Lebanon usually grows without injury, except in the extreme northern portions of the Union, if thus shaded while young. Where the shade of buildings or of other trees cannot be had, a temporary screen made of evergreen boughs, to remain through winter and the early part of spring, will answer a good purpose.

The Chili Pine, or *Araucaria imbricata*, is a tender tree, and needs not only the protection of shade, but of the dry sub-soil already mentioned. The accompanying figure is a portrait of a young tree, 12 feet high. On its native mountains, (the Cordilleras,) it attains a height of 150 feet.

CHILI PINE

FLOWERING SHRUBS.—In the second number of the Rural Register, a list only was given of some of the finer and more desirable shrubs.—The following newer sorts, mostly in addition to that list, are much admired.

Double-flowering *Spiræa prunifolia*, or Double Japan Spiræa. The genus SPIRÆA furnishes a large number of beautiful and showy herbaceous perennials and shrubs. None exceeds the Double

SPIRÆA PRUNIFOLIA.

white Japan, represented in the above figure, except that it shows nothing of the snowy whiteness of the flowers. This shrub is quite hardy, and it may be rapidly increased by layering the young and fresh stems early in summer, and they will mostly root the same season if the soil is kept moist.

DEUTZIA SCABRA.

The *Deutzia scabra*, or Rough-leaved Deutzia, when in bloom, is covered with a profusion of white flowers, and is one of our finest ornamental shrubs. It is a native of Japan, and is perfectly hardy. It grows about six feet high, and is easily propagated by layers and by dividing the plant.

The *Forsythia (Forsythia viridissima)* is one of the new shrubs found by R. Fortune in the north of China. He discovered it in the gardens of the rich mandarins, and afterwards wild among the mountains where it appeared even still more ornamental. The shoots and leaves are of a dark green color (whence the specific name *viridissima*, or *dark green*,) and the flowers of a bright yellow. Like the Mezereon and Flowering Almond, they open early in spring before the expansion of the leaves. It appears to be hardy.

FORSYTHIA VIRIDISSIMA.

Double Crimson Currant

The *Double Crimson Currant (Ribes sanguineum.)* The single crimson variety is well known; the double is more showy, and its pendent racemes when in flower, render it a striking object. Like the single crimson, it is not entirely hardy, unless shaded from the winter and spring sun; with this precaution we have never known it to be injured at 48° north latitude. On a dry soil with dry bottom, it has usually passed the winter without injury, even if unprotected in this way. The blossoms are larger than the single variety, the racemes from three to six inches in length; and the effect of the shrub, when laden in spring, with their fine pendent blossoms, is very rich and striking.

The *Halesia* or *Silver Bell*. The *Halesia diptera*, shown in the accompanying engraving, is a handsomer and much rarer species than the common Silver Bell or *Halesia tetraptera*. The former blooms later, has larger and whiter flowers, and two angles or wings to its seeds—the latter has four wings. The form and drooping position of the flowers give the name *Silver Bell* to the plant. Both species are hardy, and are propagated by seeds.

Fine Early Spring Flowering Shrubs.—Among shrubs that make an early display on the lawn, we must call special attention of young planters to the following, while their impressions are fresh on our minds. 1. The well known Japan Quince *(Pyrus Japonica)*, with its brilliant

HALESIA OR SILVER BELL.

blood-red flowers. 2. The Deep Green Forsythia, with its clear yellow flowers. 3. The Crimson Currant (*Ribes sanguinea*). 4. The Gordon's Currant (*Ribes Gordoni*), crimson and yellow. 5. The Ashberry (*Mahonia aquifolia*, evergreen), with its bright yellow blossoms. 6. The Rose-colored Wiegela (*W. rosea*), with delicate rose-colored blossoms. We may add to these the Double-flowering Spiræa (*S. prunifolia fl. pl.*), as it follows them closely, has small double flowers. These form a beautiful collection for the early spring, all perfectly hardy and flourishing without any particular care or treatment. The Mahonia we must single out because it is not yet much planted, and is very desirable. It is evergreen, bearing the winter well, the best substitute we have for Rhododendrons; then it blooms so early and so profusely; it is low and spreading, and makes a rich mass of foliage on the lawn.—P. BARRY *in Horticulturist*.

HERBACEOUS PERENNIALS.

Herbaceous Perennials, or plants that send up new stems and blossoms every year from permanently remaining roots, furnish the easiest means of beautifying a flower garden, as very little attention is needed for most of them if hardy, except in keeping the ground clean and cultivated, and some are so vigorous as to flourish even in a neglected grass sod.

PHLOX VAN HOUTII.

In season, they begin to flower early, or immediately after such bulbous plants as the Snowdrop, Crocus, Squill, &c., and by a good selection will give a profuse and brilliant supply of flowers till midsummer, and a few on till autumn.

Phlox Van Houtii, is one of the finest and most distinct of all the extensive list of Phloxes. Its beautiful striped flowers, and its long continued blooming, renders it a great desideratum. It requires care, however, being easily destroyed by drought.

ZAUSCHNERIA CALIFORNICA.

Zauschneria Californica, is one of the new Californian acquisitions, and possesses considerable beauty.—Its flowers are numerous, and of a bright scarlet. It is believed to be hardy if planted on a dry soil.

CLIMBING ANNUALS.

Annuals, although requiring some skill and labor in sowing each year, constitute a very important part of an ornamental garden, and generally succeeding next to herbaceous perennials, furnish a fine display through the latter part of summer and in autumn.

LOASA PENTLANDICA.

Canary bird flower (*Tropæolum peregrinum.*) This pretty climber belongs to the same genus of plants as the common nasturtium, and receives its English name from the resemblance of its partly expanded blossoms to canary birds. If the seeds are planted early in spring, in a light rich soil, it will grow rapidly and bloom from midsummer till frosts.

A newer Tropæolum is the *T. Lobbianum*—like the former it is a native of South America, but needs more attention; to succeed best, the plants from seeds sown the previous year in pots, should be set out in open ground early in summer.

CANARY BIRD FLOWER.

TROPÆOLUM LOBBIANUM.

PASSIFLORA KERMESINA.

The *Loasa.*—There are two fine species, namely, *L. lateritia*, or brick-red Loasa, and *L. pentlandica*. The former is remarkable for the singular form of its flowers.

It blooms in profusion through summer and autumn.—It has been known to run twenty feet the season of sowing.

The latter is more tender, partaking like the Tropæolum Lobbianum, of the character of a green-house plant.

The *Crimson Passion Flower* (*Passiflora Kermesina.*)—This is the most showy of all the passion flowers, but it is strictly a green house plant, and requires proper management.

It is to be placed in a large pot of of rich compost, and this sunk to the rim in an open border early in summer. It will grow ten feet the same season, and bloom profusely by the first of autumn.

It must be returned to the green house before autumnal frosts.

PERENNIALS FOR LAWNS.

Lawns which adjoin dwellings, should be planted towards their boundaries with trees, and more especially with evergreens, which will exclude any objects that should be shut out, and protect the house from sweeping winds. The more central and open parts may be interspersed with shrubbery and with the larger growing and more showy flowering perennial plants. If the latter are selected among the hardier and stronger sorts, they will maintain their appearance and thriftiness with a small amount of cultivation—no more than shrubs commonly require for their successful growth. Among some of the best perennial flowering plants for this purpose, are the following:

Dictamnus—the purple and white, of which the former should predominate. A mass once well established, will continue to furnish large groups of flowers early in summer, for an indefinite number of years, with only an occasional mellowing of the soil about them. The flowers are about an inch and a half across, and the spikes ten inches long; they grow about three feet high, and will spread out and form a round compact clump three or four feet in diameter, the whole top of which will be covered with a mass of flowers in their season.

The Pœonies.—There are several species and varieties of these; the masses they constitute are not so symmetrical in form as the preceding; but the size and splendor of the flowers are nearly unequalled. P. Whitleii, white; P. Reevesii, blush; P. Humeii, red; P. Pottsii, dark crimson,—(all varieties of the species *P. albiflora*) and several other varieties, produce very double flowers, often measuring six to seven inches in diameter. The common dark crimson, *P. officinalis*, were it "far fetched and dear bought," would be regarded as a wonder; and the two other varieties of the same species, *rosea* and *albicans*, (much less common) are inferior to none. All these flower early in summer.

The *Caucasian Poppy*, (*Papaver bracteatum*,) is remarkable for the very showy character of its single flowers. The color is deep crimson,

and the flowers on well established, thrifty roots, often measure *nine inches in diameter*, on stems four or five feet high. The plant does not, however, produce well formed masses.

Baptisia cerulea grows in a handsome form, and bears profusely blue spikes of flowers. The strongest varieties grow three or four feet high, and the spikes are often a foot and a half long.

Clematis erecta will form masses of foliage five or six feet in diameter, and four feet high. When in bloom, the whole top is covered with dense panicles of white blossoms, the panicles often a foot in length. It flowers about mid-summer.

Spiræa aruncus, produces large graceful plumes of white flowers early in summer, and *S. lobata* very beautiful masses of rose-colored flowers a month or two later,—both being strong-growing large plants.

The numerous varieties of *Phlox paniculata*, of all shades of colors from pure white to deep red or purple, and some of them finely variegated, are not excelled for the handsome and showy appearance they present in the latter part of summer, some of them growing five or six feet high, and forming finely shaped round groups of foliage with very large panicles of flowers at the summit.

Among the later blooming or autumn plants, we have never seen any thing to excel a large mass of the New England Aster (*Aster novæ-anglicæ*) the exterior form of which was much like that of a balloon, and was about five feet in diameter each way, the whole upper surface being one uninterrupted mass of purple flowers.

All the preceding are perfectly hardy, and need only a good rich soil, moderate cultivation, and a few years to become well established, in order to come fully up to the sizes we have mentioned. There are doubtless many others that might be added to the list.

ARTIFICIAL ROCK-WORK.

No part of ornamental gardening appears to be less understood, than the construction of artificial rock-work. A few years since, in visiting one of the most celebrated and costly rural residences in this country, we observed an artificial specimen of the kind, consisting of a nearly conical pile of stones, weighing fifty to one hundred pounds each, and perhaps containing half a dozen loads in all, placed in the midst of a smooth, level piece of the highly cultivated grounds. We have often seen examples of this kind, and the great error in thus introducing them appears to be, first, that such as these are not pleasing objects in themselves; secondly, that there is no imitation of nature in them, for nature never furnishes us with conical or formal piles; thirdly, in placing them in a level, cultivated garden, where we do not look for any such objects, and where stone-heaps are an evident obstruction to cultivation. Only twenty rods from the rock-work in the celebrated garden we have

TAME AND ARTIFICIAL ROCK-WORK.

spoken of, in an adjoining grove, was a *natural* specimen worthy of the name, consisting of huge rocks protruding from a slope, partly concealed by earth, and covered with patches of moss, in the thick shade of trees, whose old and twisted roots occasionally enwreathed them. Here everything was in keeping—rough, bold, massive, and picturesque.

NATURAL AND PICTURESQUE ROCK-WORK.

As a general rule, rock-work should not be placed on level ground, but on the side of a slope, bank, or side of a ravine—just at those places where in nature, beds of rocks are to protrude. It should be more or less shaded by trees, and the rocks themselves should be partly covered with plants growing in their crevices. Climbing and trailing plants are especially appropriate, and when in flower they have an exceeding pleasing effect. It often happens, that rocks of this character may be found already in place on the spot; and all that is necessary is to improve what nature has furnished, by the introduction of the plants we have spoken of, and of clearing away whatever is offensive. But where the rocks are to be furnished, they must be large and massive,—the larger the better,—weighing a ton or more. On the banks of a small stream, rocks are always an interesting object; and a small cascade dashing amongst them, or a rill trickling down their sides, in the midst of occasional plants in flower, gives them an exceedingly pleasing character.

TOADS IN GARDENS.—Various remedies have been given for the prevention of the ravages of insects in gardens. Worms, or the larvæ of certain moths and beetles, often make great destruction among many kinds of plants. Various kinds of bugs attack melons, cucumbers, squashes, &c., and often destroy the crop soon after it appears above ground. Young chickens and ducks are sometimes kept in gardents, that they may devour the insects. This is but a partial remedy. Chickens will only eat a few specics of insects—some of the most destructive they leave unnoticed—and they will always do more or less injury by eating plants and by scratching. But *toads* will do much more good (if well grown,) than either chickens or ducks. They do no injury whatever; they feed altogether on insects, and devour almost every species that infests the garden. They have another advantage over chickens and ducks—they seek their food at times when insects are most abroad; at dusk of evening, when fowls are at rest. Excepting the black "pumpkin bug," toads will fill their stomach with any bug, worm or fly, that belongs to the catalogue of enemies to the farmer or gardener.

RUSTIC SEATS AND STRUCTURES.

GREAT reform is needed among country residents in relation to the attractions for *open air*. There are members of every family who suffer serious loss both in health and spirits, from an almost perpetual confinement within doors. Trees, flowers, walks, and shady seats, are far more important than splendid drawing rooms and costly furniture. The most pleasant and agreeable summer parlor the writer ever occupied, and in which he has spent many days during the heat of summer, was formed only by the dense shade of leafy boughs overhead, beneath which the cooling breezes could freely pass among the trunks of the trees. For the purpose of inviting attention to the increase of these out-door attractions, by pointing out a mode of providing such summer parlors as these with appropriate furniture within the reach of all, and for adding to the interest of the *more secluded parts* of the ornamental grounds, we propose to devote a short chapter.

Seats, arbors, and other structures, made of *rustic work*, that is, of the trunks and branches of trees in their natural forms, have much to commend them to the peculiar wants of landscape gardening in America. They admit a great display of taste and ingenuity, with but little cost—an important consideration where the motto of the people must be, "profuse of genius, not profuse with gold."

There are very few of our countrymen who will consent to give a highly polished air to their grounds, except in the immediate proximity to their dwellings, and even here the claim to much finish, is commonly a very doubtful one at best. It is even rare to find other parts of ornamental grounds so highly kept, that such costly ornaments as vases and statues are not quite out of place; and it is quite as rare to find those who ought to be so lavish of their money as to incur the expense.

Most objectionable of all, on the score of taste, are those heavy wooden structures, made of elaborate carpentry, for the support of climbing plants, or for summer shelter, so commonly seen in various parts of the country. Nothing can be more incongruous than the forced connexion between those most delicate and graceful of all plants, twiners and climbers, and stiff, formal and heavy board supports. A simple and appropriate rustic material is as much superior to these, as a charcoal sketch by a skilful artist, is superior to the rich daubings of a sign painter.

It should be distinctly remembered, however, that rustic structures should not be placed near a highly finished dwelling, but in the less formal and more sequestered parts of the grounds, except it be those of a smaller size, and of the more simpler forms. On the other hand, a small cottage, possessing little formality, will more freely admit these structures in all situations.

In order to succeed in constructing rustic work, the first thing is to procure *the materials*. All such objects as may be exposed to the weather should be of the most durable wood, of which red cedar is best. For certain purposes, white oak will answer well, but as it is essential to have the bark remain on, the wood should be cut at a time of year when this

will not peel or separate. If cut towards the close of summer, the wood will last about twice as long as when cut in winter or spring. A horse load or two, of boughs or branches of trees, of which a goodly portion may be curved and twisted, from one to six inches in diameter, will constitute the materials for a good beginning.

Fig. 1.

Among the simplest objects, are rustic stools, figs. 1 and 2, which nearly explain themselves. The first is made of nearly straight pieces, put together by boring holes for the principal framework, and using nails for the smaller pieces. The second is simpler and stronger, but requires two curved branches or portions of roots. The rustic chair, fig. 3, has the face of the back and seat made of "wood mosaic," a mode of facing flat surfaces of boards and plank represented more distinctly by figs. 9 and 10,—the small and straight shoots which are split into two parts for this purpose, being, unlike other rustic material, with *smooth* back. This mode of working admits of the exercise of much taste and ingenuity, as rods having differently colored bark may be used and so arranged as to give an interesting variegated appearance. This kind of work, is often used with great advantage for facing the interior walls of rustic summer houses; and in all cases, the design, however simple, should be first marked with chalk on the board-facing intended to be covered. It is usually made of the halved rods as shown in fig. 9; but for the bottoms of seats, a more even surface is presented by shaving the edges, as in fig. 10. Sometimes *bark* alone is used for this purpose.

Fig. 2.

Fig. 3.

Fig. 9.

Fig. 10.

Fig. 4

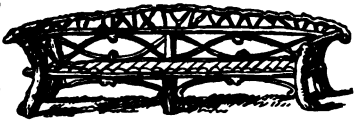


Fig. 5.

Fig 6

Fig. 4 is a lighter and simpler chair. The outer portion of the back will be strongest if in one piece, and a portion of wild grape-vine may be advantageously employed. The seats shown by figs. 5 and 6 require but little explanation. Fig. 5 may be formed of nearly straight pieces of wood; the back of fig. 6 will require 2 or 3 crooked pieces strongly and neatly spliced together. It may be

well to add here, that the perfection of all rustic work renders very close and perfect joints absolutely necessary. The back of the seat shown by fig. 7 is let into or fastened to the middle of the tree.

Fig. 7.

The table, fig. 8, is formed of the trunk of a tree with well selected branches, inverted; to the top of which is nailed circular boards, battened crosswise together, and covered with "wood mosaic" already described.

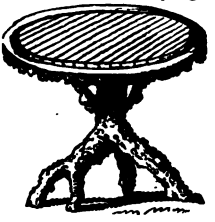


Fig. 8.

Fig. 11 is a flower stand, supported by a leg formed of the branching trunk of a tree, with braces nailed on below. The top is wicker-work, and will receive a round tin pan, filled with clear wet sand, and covered with a lid of basket or seive-work, through the openings in which the stems of flowers may be thrust into the sand, which will keep them fresh for several days. Fig. 12 is a similar stand, made stronger, to hold a box or pot of rooted plants.

Fig. 11.

Fig 12.

Fig. 13 is a pedestal for flower-pots, and may be a neat and handsome ornament for any part of the grounds. It is easily made of a wooden box, covered with the mosaic of wood.

Fig. 13.

Fig. 14 is a rustic foot-bridge. It should be strong and durable, and the joints secured by iron bolts, although withes are afterwards applied to give it a more picturesque appearance. The ends may be supported on stone abutments, which may be made to constitute a very appropriate rock-work, much more natural and suitable than where an unmeaning pile of stones is placed on level ground as is sometimes seen.

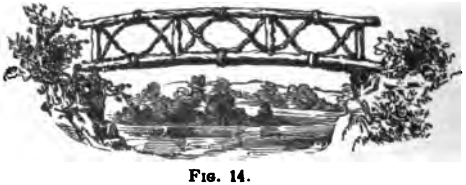


Fig. 14.

Fig. 16.

Fig. 15 is a rustic arbor, requiring but little explanation. If the straw forming the thatched roof, is kyanized, it will last a long time. The cornice is or-

FIG 15

namented with cones of the white pine, nailed to the horizontal board supporting the roof.—Cones of different size are very suitable for interior cornices of rustic buildings, a specimen of which is shown in fig. 16. They may be used for the interior overhead. Moss is also used for the last named purpose, the surface overhead being first covered with rods placed an inch apart, and the moss with the ends even, rammed

FIG. 17.

Fig. 18

in between with a wooden wedge, so as to cover the rods from view. It is only the larger mosses that will answer for this purpose; and by selecting those of different colors, or by dyeing a part of them with log-wood, a surface resembling a Brussels carpet is presented. This is however attended with more labor than most of the contrivances we have described.

Figs. 17 and 18 are rustic arbors, with variations in design.

Fig. 19.

Fig. 19 is a prospect tower, to be placed on any wooded hill where an extensive view is afforded. Six strong upright poles are first set into the ground, and secured by cross-pieces at the top and middle. The upper roof may be of straw or boards, and the lower of boards, the latter covering the whole interior and forming a separate apartment below. The tower is ascended by stairs placed within. The shorter posts below serve to stiffen the structure, and furnish a verandah round the whole, where seats may be placed.

All the structures we have described, taken together, if built in the best manner, would not cost so much as single statues or vases of marble; and as a proof of their durability when made of the right materials,

Fig. 20.

we may state that there are specimens in England, which have been exposed to all weathers, now more than forty years old.

Before closing this article, we give the view of a log house, rendered an ornamental object, by a few rustic additions, fig. 20, and by means of climbing roses, &c., made more pleasing than a bleak, costly edifice. Every ingenious owner of a log-house in the west, may thus, by a little labor and contrivance, make an attractive home without a long purse to pay masons, carpenters, joiners and painters.

Raising Blackberries and Raspberries from Seed.—Raspberry and blackberry seed require very much the same treatment as mountain ash seeds—that is, preservation of the natural moisture by immersion from the fruit in moist sand, earth, or peat, and exposure to the freezing of winter. Small seeds, as the raspberry and mountain ash, must be buried very shallow, in order to germinate—not over one half an inch at most, and the moisture of the fine earth with which they are covered must be preserved by proper shading.

As this is an important and interesting subject, we applied to Dr. Brinckle of Philadelphia, who has had so much experience as well as success in raising new varieties, and have been favored with the following answer:—"I have no experience in the germination of seed of our indigenous black raspberry. In regard to the blackberry, I planted seed several seasons without obtaining from them a single plant. In the summer of 1854, as soon as the berries were ripe, I planted a few blackberry seeds in pots, which were left in the open air all winter. Many of the seed germinated in the spring of 1855, and continued to do well. As a general and almost invariable rule, blackberry seed, even when planted immediately after the maturity of the berry, will not germinate until the ensuing spring. But, in one or two instances, I have known germination to take place the same season the berry ripened."

WEIGHTS AND MEASURES.

MEASURES OF LENGTH.

Gunter's Chain—7.92 inches = 1 link.
100 links = 4 rods, 22 yards, or 1 chain.

Shoemakers.—No. 1, is 4⅛ inches in length, and every succeeding number is ⅓ of an inch. There are 28 divisions, in 2 series of numbers, viz: from 1 to 13, and 1 to 15.

A French *metre* is = 3.28174 feet. A *hand* is 4 inches.

Number of Plants or Trees that can be planted on an acre of ground, at the following distances apart, in feet.

Distances apart.	No. of Plants.	Distances apart.	No. of Plants.
1 by 1	43,560	7 by 7	888
1½ " 1½	19,360	8 " 8	680
2 " 1	21,780	9 " 9	537
2 " 2	10,890	10 " 10	435
2½ " 2½	6,969	11 " 11	360
3 " 1	14,520	12 " 12	302
3 " 2	7,260	13 " 13	257
3 " 3	4,840	14 " 14	222
3½ " 3½	3,555	15 " 15	193
4 " 1	10,890	16 " 16	170
4 " 2	5,445	17 " 17	150
4 " 3	3,630	18 " 18	134
4 " 4	2,722	19 " 19	120
4½ " 4½	2,151	20 " 20	108
5 " 1	8,712	24 " 24	75
5 " 2	4,356	25 " 25	69
5 " 3	2,904	27 " 27	59
5 " 4	2,178	30 " 30	48
5 " 5	1,742	40 " 40	27
5½ " 5½	1,417	50 " 50	17
6 " 6	1,210	60 " 60	12
6½ " 6½	1,031	66 " 66	10

Multiply the distances into each other, and divide it by the square feet in an acre, or 43,560, and the quotient is the number of plants.

MEASURES OF SURFACE.

Drawing Paper.

	Inches		Inches.
Cap	13 × 16	Columbian	33¾ × 23
Demy	19½ × 15½	Atlas	33 × 26
Medium	22 × 18	Theorem	34 × 28
Royal	24 × 19	Double Elephant	40 × 26
Super-royal	27 × 19	Antiquarian	52 × 31
Imperial	29 × 21¼	Emperor	40 × 60
Elephant	27¾ × 22¼	Uncle Sam	48 × 120

MEASURES OF CAPACITY.

Standard gallon = 231 cubic inches.

Gallon of the State of New-York = 221.184 cubic inches, or 8 lbs. of pure water of maximum density.

Imperial gallon (British) or *dry measure gallon* here, = 277 274 cubic inches = 10 lbs. of distilled water at 62° Fahrenheit. A gallon of flour = 7 lbs. Ale gallon = 282 cubic inches.

U. S. standard bushel or *Winchester bushel*, contains 2150.42 cubic inches. Its dimensions are 18½ inches diameter inside, and 8 inches deep, and when heaped the cone must not be less than 6 inches high, = 2747.70 cubic inches for a true cone.

Bushel of the State of New-York, contains 80 lbs. pure water at maximum density, or 2211.84 cubic inches.

1 chaldron = 86 bushels = 57.25 cubic feet.

1 perch stone = 24.75 cubic feet. Mason's perch, after laying, 22 cubic feet.

Lime bushel is 18½ inches diameter at bottom, 15 at top, and 18.47 deep

A box 16 inches by 16 8-10, and 8 inches deep, will contain one bushel.

A box 8 by 8 inches square, and 4 1-5 inches deep, will hold a half peck—4 by 4 inches and 4 1-5 deep is a quart.

TABLE OF SPECIFIC GRAVITIES.

Metals.

Gold, pure	19.36	Iron	7.78
" standard	17,16	" cast	7.20
Mercury	13.58	Steel	7.82
Lead	11.35	Brass, common	7.82
Silver	10.50	Tin	7.29
Copper	8.82	Zinc	6.86

Stones and Earths.

Brick	1.90	Gypsum	1.87 to 2.17
Chalk	2.25 to 2.66	Limestone	2.38 to 3.17
Clay	1.93	Lime, quick	.80
Coal, anthracite, about	1.53	Marble	2.56 to 2.69
Coal, bituminous	1.27	Peat	.60 to 1.32
Charcoal	.44	Salt, common	2.13
Earth, loose, about	1.50	Sand	1.80
Flint	2.58	Slate	2.67
Granite, about	2.65		

Woods—dry.

Green wood often loses one-third of its weight by seasoning, and sometimes more. The same kind varies in compactness with soil, growth, exposure, and age of the trees.

Apple	.68 to .79	Pine, yellow	.55 to .66
Ash, white	.72 to .84	Oak, English	.98 to 1.17
Beech	.72 to .85	" white	.85
Box	.91 to 1.32	" live	.94 to 1.12
Cherry	.71	Poplar, Lombardy	.40
Cork	.24	Pear	.66
Elm	.58 to .67	Plum	.78
Hickory	.84 to 1.00	Sassafras	.48
Maple	.65 to .75	Walnut	.67
Pine, white	.47 to .56	Willow	.58

Miscellaneous.

Beeswax	.96	Oil, whale	.92
Butter	.94	" turpentine	.87
Honey	1.45	Sea water	1.02
Lard	.94	Sugar	1.60
Milk	1.03	Tallow	.93
Oil, linseed	.94	Vinegar	1.01 to 1.08

Weights of a Cubic Foot of various Substances, from which the Bulk of a Load of one Ton may be easily calculated.

Cast Iron	450 pounds.
Water	62 "
White pine, seasoned, about	30 "
White oak, " "	52 "
Loose earth, about	95 "
Common soil, compact, about	124 "
Clay, about	135 "
Clay with stones, about	160 "
Brick, about	125 "

Bulk of a Ton of different Substances.

28 cubic feet of sand, 18 cubic feet of earth, or 17 cubic feet of clay, make a ton. 18 cubic feet of gravel or earth before digging, make 27 cubic feet when dug; or the bulk is increased as three to two. Therefore, in filling a drain two feet deep above the tile or stones, the earth should be heaped up a foot above the surface, to settle even with it, when the earth is shoveled loosely in.

CONTENTS OF CISTERNS.

The amount of water which falls upon most farm-buildings is sufficient to furnish a plentiful supply to all the domestic animals of the farm when other supplies fail, if cisterns large enough to hold it were only provided. Generally speaking, none at all are connected with barns and out-buildings, and even when they are furnished, they are usually so small as to allow four-fifths of the water to waste.

If all the rain that descends in the Northern States of the Union should remain upon the surface without sinking in or running off, it would form each year a depth of about three feet. Every inch that falls upon a roof yields two barrels for each space ten feet square, and seventy-two barrels a year are yielded by three feet of rain. A barn thirty by forty feet supplies annually from its roof 864 barrels, or enough for more than two barrels a day for every day in the year. Many farmers have in all five times this amount of roof, or enough for twelve barrels a day yearly. If, however, this water was collected, and kept for the dry season only, twenty or thirty barrels daily might be used.

In order to prevent a waste of water on the one hand, and to avoid the unnecessary expense of too large cisterns, their contents should be determined beforehand by calculation.

RULE FOR DETERMINING THE CONTENTS.

A simple rule to determine the contents of a cistern, circular in form, and of equal size at top and bottom, is the following: Find the depth

and diameter in inches; square the diameter and multiply the square by the decimal .0084, which will find the quantity in gallons for one inch in depth. Multiply this by the depth, and divide by 31½, and the result will be the number of barrels the cistern will hold.

For each foot in depth, the number of barrels answering to the different diameters are,

For 5	feet diameter	4.66	barrels
6	"	6.71	"
7	"	9.13	"
8	"	11.98	"
9	"	15.10	"
10	"	18.65	"

By the rule above given, the contents of barn-yard cisterns and manure tanks may be easily calculated for any size whatever.

DETERMINING THEIR SIZE.

The size of cisterns should vary according to their intended use. If they are to furnish a daily supply of water, they need not be so large as for keeping supplies for summer only. The average depth of rain which falls in this latitude, although varying considerably with season and locality, rarely exceeds seven inches for two months. The size of the cistern, therefore, in daily use, need never exceed that of a body of water on the whole roof of the building seven inches deep. To ascertain the amount of this, multiply the length by the breadth of the building, reduce this to inches, and divide the product by 231, and the quotient will be gallons for each inch of depth. Multiplying by 7 will give the full amount for two months' rain falling upon the roof. Divide by 31½, the quotient will be barrels. This will be about fourteen barrels for every surface of roof ten feet square when measured horizontally. Therefore, a cistern for a barn 30 by 40 feet should hold 168 barrels; that is, as large as one ten feet in diameter and nine feet deep. Such a cistern would supply, with only thirty inches of rain yearly, no less than 630 barrels, or nearly two a day.

Cisterns intended only for drawing from in times of drought, to hold all the water that may fall, should be about three times the preceding capacity.

WEIGHTS.

1 bushel of	Wheat	= 60	lbs.	1 bushel of	Flax seed	= 56	lbs.
"	Beans	= 68	"	"	Salt,	= 80	"
"	Peas	= 64	"	"	" coarse	= 85	"
"	Corn	= 58	"	"	" fine	= 70	"
"	Barley	= 47	"	"	Hemp seed	= 44	"
"	Oats	= 38	"	"	Timothy "	= 56	"
"	Potatoes	= 60	"	"	Blue grass	= 14	"
"	Rye	= 58	"	"	Dried apples	= 22	"
"	Clover seed	= 60	"	"	" peaches	= 33	"

VELOCITY OF WIND.

Wind is air in motion. Its force depends on its speed. When its motion is slow, it constitutes the soft, gentle breeze. As the velocity increases, the force becomes greater, and the strong gale sweeps round the arms of the wind-mill with the strength of many horses, and huge ships

are driven swiftly through the waves by its pressure. By a still greater velocity of the air, its power becomes more irresistible, and solid buildings totter, and forest trees are torn up by the roots in the track of the tornado.

The force of wind increases directly as the square of the velocity. Thus a wind blowing ten miles an hour exerts a pressure four times as great as at five miles an hour, and twenty-five times as great as at two miles an hour. The following table exhibits the force of wind at different degrees of velocity:

Miles an hour	Pressure in lbs. on a square foot.	Description.
1	.005	Hardly perceptible.
2	.020	Just perceptible.
3	.045	
4	.080	Light breeze.
5	.125	
6	.180	Gentle, pleasant wind.
7	.320	
10	.500	Pleasant, brisk wind.
15	1.125	
20	2.000	Very brisk.
25	3.125	
30	4.500	Strong, high wind.
35	6.125	
40	8.000	Very high.
45	10.125	
50	12.500	Storm or tempest
60	18.000	Great storm.
80	32.000	Hurricane.
100	50.000	Tornado, tearing up trees, and sweeping off buildings.

PREPARING SOIL FOR GARDENS.

There are several reasons why the soils of gardens should be made better than for ordinary farm crops. 1. Most of the products of gardens are of a succulent nature, or will otherwise bear high feeding, such as garden *roots* in general, plants whose *leaves* furnish food, as lettuce, cabbages, &c., or those which produce large and succulent fruits, as cucumbers, melons, squashes, &c. 2. As nearly all garden crops are the immediate food of man, while many farm crops are only the coarser food of animals, greater care and skill may properly be applied in bringing the former forward to a high degree of perfection. 3. The great amount of family supplies which may be obtained from a half-acre garden, provided the best soil is prepared for their growth, renders it a matter of equal importance and economy, to give the soil the very best preparation.

It rarely happens that there is much selection to be made in soils as we find them in nature, for gardening purposes, unless particular attention is given to the subject in choosing a site for a new dwelling. Generally, we have to take the land as we find it. Unless, therefore, we happen to

find it just right, we should endeavor to improve it in the best manner. The principal means for making a perfect garden soil, are *draining*, *trenching* and *manuring*.

Now lest any one should be startled at the outset, with the *fear of cost*, in thus preparing the soil, we may remark that the entire expense of preparing half an acre, (which would constitute a large kitchen garden,) would not in general, amount to more than the amount saved in a single year in the purchase of food for family supplies, by the fine and abundant vegetables afforded. If the owner cannot possibly prepare his half or quarter acre of land properly, then we would earnestly request him to occupy the ground with something else than garden crops, and to take only a single square rod, (if he cannot attend to more,) and give this the most perfect preparation. A square rod of rich, luxuriant vegetables, will be found more valuable than eighty rods or half an acre of scant, dwarfed, and stringy growth, which no one will wish to eat; while the extra cost and labor spent on the eighty rods in seeds, digging and hoeing, would have been more than sufficient to prepare the smaller plot in the most complete manner.

Let the determination be made, therefore, at the commencement, to take no more land than can be properly prepared, and in the most *thorough manner*.

1. *Draining*. A few soils do not require draining, but with most it will be indispensable. Where the subsoil is gravelly or porous, so that any amount of extra surface water will be immediately discharged below, the operation is not needed; but in all cases where, in digging a hole two feet deep, the water is found to stand in its bottom during the wetest times, we may be sure that draining will be of great importance, in preventing a cold, sour subsoil, and stagnant water beneath its surface. Such a condition of the soil could not fail to prove exceedingly detrimental to good growth, and drains not more than thirty feet apart should be made as the first indispensable requisite. No one who has never given draining a full and fair trial, can appreciate its importance. It often happens that the soil may be worked and planted from two to four weeks earlier in spring—a most important advantage for *early* vegetables, where a few days of accelerated maturity are so highly valued. Scarcely less, is the benefit during the rest of the season, in preventing a hard and baked soil in times of drouth.

2. *Trenching*. A surface soil of a few inches only, will not answer for a good garden. The roots of succulent vegetables must extend into a deeper bed of fertility; and a greater depth of pulverization is required to absorb surplus rains, and to give off the accumulated moisture in dry weather. A shallow soil will become deluged by a single shower, because the hard subsoil will not allow it to pass downward; and again, in the heat and drouth of midsummer, a thin stratum is made dry and parched in a week, while one of greater depth becomes scarcely affected. We might cite numerous instances, where trenched gardens remained in the finest state of luxuriance during the most severe drouths, when others under ordinary management were nearly burnt up with the heat, growth having quite ceased, and leaves curled and withering for want of moisture.

The *mode* of trenching must vary with circumstances. In small circumscribed pieces of ground, necessity requires it to be done by hand,

according to the well known process of throwing the earth to one side, from a ditch cut between the trenched and untrenched portions of the ground. It is not unusual to trench three feet deep for trees, but for the kitchen-garden two feet or even twenty inches, will answer an excellent purpose, and prove incomparably better than its entire omission. Disappointment sometimes results from the practice of throwing the poorer subsoil to the top; this should be avoided, or at least but a portion of the lower soil mixed with the upper, and the same time a copious amount of manure mixed through and more abundantly applied near the bottom. Compost or old manure is best; but fresh manure will answer nearly or quite as well, provided it is thoroughly broken up with an iron rake and mixed in, as the work advances.

The cost of trenching by hand may appear great, but when its future results are taken into the account, it will be found to be a remarkably paying expenditure, the gain amounting perhaps, to five hundred or a thousand per cent. for subsequent years. It may be greatly cheapened on all grounds where a team can be used, by the subsoil plow, to loosen up to a depth of one and a half to two feet. A double Michigan plow may be afterwards employed with great ease in this loosened bed of soil, to bring any desired portion to the surface, but more especially for working in through all parts a plentiful supply of manure. The cost of preparing thus a half acre of garden ground, will be about as follows:

One coat of manure or compost, 10 loads drawn	$10.00
Two thorough harrowings of this manure to break and intermix it	.25
Plowing with a common plow, followed with a subsoiler and double team	8.00
Another coat of manure, 20 loads	20.00
Two thorough harrowings	.25
The whole thrown under to a depth of 15 inches, by large Michigan plow and tripple team	8.00
A third coat of manure, 20 loads	20.00
Two harrowings	.25
Plowing under with a common plow, about 8 inches	1.00
Total cost for preparing garden ground	$57.75

Of this expense, $50 are paid for fifty loads of manure, (for half an acre, or 100 loads per acre,) and only $7.75 for all else, after the manure is applied, the drawing of the manure being reckoned with the cost, $1 per load. The manure would cost the same, if applied in the common way, and would be much less efficient, hence the subsoiling, plowing and harrowing, are operations of great economy, if only the saving in the manure is considered.

The mode and depth of some of the plowings must be made to vary with circumstances. If the subsoil is sterile, the plowing after the subsoiling must not be so deep; and a fourth coat of manure, well harrowed, and turned under with a gang-plow, will be advisable. The precaution must be observed, however, in any modification of the preceding process, to throw down each successive coat of manure to a depth different from the others. If *fresh* manure is applied, a greater number of harrowings will be necessary to break and intermix it, an operation of

the greatest importance, and increasing *several times* the efficiency of the manure, according to careful experiments.

The present time of year will be found suitable for preparing for some of these operations. Sometimes hand-trenching may be done to great advantage towards the close of winter, when the subsoil is softened with moisture and digs easily; and manure may be collected and sometimes composted. If the composts are prepared a year, or at least several months ahead, all the better.

VALUABLE FACTS.

Powdered chalk added to common glue, strengthens it. Boil 1 lb. of glue with 2 quarts of skimmed milk, and it will resist the action of water.

New wood-work requires about 1 lb. of paint to the square yard, for three coats.

Copper and gold will conduct electricity six times better than iron or tin, and twelve times better than lead. Zinc will conduct nearly twice as well as iron; silver more than four times better.

Wood is 7 to 20 times stronger lengthwise than transversely.

Melted snow produces about one-eighth of its bulk of water.

At a depth of 45 feet, the temperature of the earth is uniform throughout the year.

Cast iron expands 1-162,000 of its length by 1 degree of heat, and wrought iron 1-143,000. It requires 46 tons per square inch to crush cast iron.

Hay.—11 to 12 cubic yards of clover hay weigh a ton; 10 cubic yards of meadow hay, and 8 or 9 from old, settled stacks.

Cement.—2 parts ashes, 8 parts clay, and 1 part sand, mixed with oil, will resist the weather equal to marble.

It requires about 18 cubic feet of air for the combustion of 1 lb. of tallow, wax or oil; and about the same for the combustion of a pound of coal or pine wood.

One pound of good seasoned wood will raise 27 lbs. of water from the freezing to the boiling point, if no heat is wasted.

The farmer who burns 25 cords of green wood in a winter, loses heat in evaporating the sap, enough to boil more than 15,000 gallons of water.

A hemp rope one inch in diameter will support a weight or force of 5,000 pounds, but in practice, should not be subjected to more than one-half this strain.

A rod of good iron is about ten times as strong as the best hemp rope of the same size.

A manilla rope is about half as strong as the best hemp.

To find the area of a circle, multiply the square of diameter by .7854.

To find the contents of a sphere, multiply the cube of the diameter by .5236.

To measure corn in the crib, multiply the length, breadth and height together, in feet, multiply this product by 4, strike off the right figure, and the result will be shelled bushels.

FOOD CONSUMED BY DIFFERENT ANIMALS

THE SAME FOR EQUAL WEIGHTS.

In BOUSSINGAULT'S experiments, the daily average consumption of 17 horses and mares, aged from 5 to 12 years and weighing on an average 1070 lbs., was 88 lbs. of hay each, per day, equal to 8.08 lbs. of hay per day to each 100 lbs. of live weight. His milch cows, weighing on an average 1466 lbs., are also allowed 88 lbs. of hay per head, per day. This gives to each 100 lbs. of live weight 2.25 lbs. of hay per day.

As might be expected BOUSSINGAULT found that 14 growing animals, from 5 to 20 months old, required more food, or 100 lbs. live weight required 8.08 lbs. of hay per day.

BOUSSINGAULT estimates from his experiments, that pigs consume an equivalent of hay per day equal to 8 per cent of their live weight. Sheep, too, require about the same amount.

In some experiments made in consequence of premiums offered by the Worcester County (Mass.) Agricultural Society on the economy of cutting food for stock, a pair of working oxen belonging to A. H. HAWES, and kept at moderate work weighing 3134 lbs. consumed 75.2 lbs. of hay per day; or 100 lbs. live weight consumed 2.4 lbs. of hay per day. A pair of steers, belonging to HARVEY DODGE, weighing 2220 lbs., consumed 51.2 lbs. of hay per day, equal to 2.84 per cent live weight. Two dry cows belonging to C. B. DEMOND, and weighing 1784 lbs. consumed 43.5 lbs. of hay per day or 2.42 per cent of their live weight. Two *milch* cows, belonging to W. S. LINCOLN, weighing 1800 lbs. consumed 43.2 lbs. of hay per day, equal to 2.4 per cent of live weight.

Mr. BARNUM'S elephant, weighing 4700 lbs. consumes 100 lbs. of hay and a bushel of oats per day; 100 lbs. live weight, therefore, consume 2.12 lbs. of hay and 0.68 lbs. of oats per day, or, estimating, as BOUSSINGAULT does, that 68 lbs. of oats are equal to 100 lbs. of hay, the elephant consumes 3.12 lbs. of hay per day for each 100 lbs. live weight. To recapitulate therefore, 100 lbs. live weight of animal requires of hay per day, in

Working horses	3.08
Working oxen	2.40
Milch cows, (Boussingault's)	2.25
do do (Lincoln's)	2.40
Young growing cattle	3.08
Steers	2.84
Dry cows	2.42
Pigs (estimated)	3.00
Sheep	3.00
Elephant	3 12

There is considerable difference in these figures, but certainly not as much as might be expected from such various animals. The elephant consumes the most, the working horses and young cattle the next highest amount, then the sheep and pigs, and what is surprising the large *milch* cows of Boussingault consume least of all. Working oxen would appear to consume less than horses. On the whole, these figures give little indication that large animals consume less in proportion to their weight than smaller ones.—*Country Gentleman.*

PACKING TREES AND PLANTS.

It is estimated that there are over four thousand acres of land under nursery culture in western New-York, nearly all of which is for raising fruit trees. At a moderate computation, at least two million dollars worth of trees (at retail prices) are sent out from these nurseries annually—or not less, probably, than ten million trees. What becomes of these ten millions? Do they all reach a thrifty, bearing condition? Very far from it—we question if one-fourth ever do; and some have estimated that not a tenth, or even a twentieth, ever advance beyond a stunted growth at best. The casualties are—mutilation in removal; loss from bad packing or no packing at all, for transporting them from one place to another; careless setting out; but especially a neglect of cultivation after they have been fairly transplanted, by which a large portion of those that pass successfully through the previous stages, are parched up by drouth, and choked down by weeds and grass, and all those which are not thus killed, linger in a doubtful existence for many subsequent years.

At present we shall confine our remarks to *good* and *bad packing*.

Drying and exposure to the air always injures roots. The longer the exposure, and the greater the drying process, the greater of course is the injury. Digging up trees when destitute of leaves, and leaving them an hour or two in the shade, produces but little or no harm; but to remain in the sun, or to expose them for a whole day to the air, should not be allowed. If they cannot be set out or packed immediately, they should have the roots plunged in a bed of mud, to give the surface a thin coating; or the roots should be immediately buried in mellow soil or sand, until further operations are commenced upon them.

Nothing is more common than serious injury to trees by deficient packing. Nearly all those from nurseries are carried to some distance. Some are taken by wagons; and the practice has not been an unusual one, to leave the roots exposed for days together. If the trees afterwards lived, it was because they had an inherent power to recover from their nearly dead condition to which they were thus reduced. Many trees are now sent by steamboat and railroad, and are sometimes weeks on the way. In such cases, the complete protection and preservation of the roots is a matter of the greatest consequence. The packing in which the roots are imbedded, should as nearly as possible resemble in effect, the bed of moist soil from which they are removed. This is most effectually accomplished by first dipping the roots into mud, and then surrounding them with damp moss. At the same time, to prevent external injury, the roots and branches must be well surrounded with straw, if in bundles, or with a strong box if the latter is used.

Packing well, requires considerable practice and skill, and many nurserymen do not understand it as they should do. It also involves some expense, which purchasers often begrudge, and hence to save five per cent in this way, often lose fifty per cent of their trees by exposure.

The great number of trees packed annually, and the large amount on which the work is imperfectly performed, induces us to offer a few practical hints to beginners.

In the first place, the *materials* must be provided. For packing *bundles*, these must be, 1, a prepared bed of mud, which is best made by

setting half a hogshead (made by sawing in two) in the ground, in which to stir thoroughly the soil and water; 2, moss; 3, straw. of which rye is much the best; 4, straps of stout leather, two and a half inches wide, with very strong buckles at one end; 5, cord, about one-fourth or one-third of an inch in diameter; 6, strong sowing twine; 7, a strong packing needle, six inches long; 8, bass mats, sacking or gunny cloth; 9, directing labels, which may be planed pine board, half an inch thick, or very thick shingles, about a foot long, and three inches wide; 10, a small quantity of white lead paint, and a soft, black lead pencil, to give the direction or address.

To pack a bundle, first lay down on the ground, two of the leathern straps already spoken of, about three or four feet apart and parallel with each other; on these deposit a layer of long, straight, rye straw, about two or three inches in thickness. If the trees are long, lay down another strap, and another length of straw lapping on the last. Then place a layer of moss on one end of the straw, and the roots of the trees, previously dipped in the mud, on the moss. Proceed to lay on the trees successively, sprinkling moss among the roots, and straw among the stems and branches, taking care at the same time that the roots lie as compactly as possible with each other, and the stems perfectly parallel and not crossing. When a sufficient number of trees are made into a pile for a bundle, a layer of moss is laid over the roots, and straw on the stems and branches, as below. The straps are then brought up, and two or three men draw them strongly through the buckles, until the whole is compressed into a round and compact bundle. Next, in order to secure the straw firmly to its place, (having previously, while drawing the bundle together, adjusted it evenly over the whole surface,) a cord must be passed around from bottom to top at intervals of six inches to a foot, first tying it to a strong root, and then proceeding upwards by successive loops, as in fig. 1. To keep the straw to its place, these loops must be tightened with great force, which is best accomplished by two men working together, one of whom forms the loop and keeps it to its place, and the other passing the cord around a short strong stick, draws upon it by this means with his whole strength, the first one holding it to its place while another loop is made. The The end of the bundle being slightly raised on a bench from the ground, the work is rapidly accomplished—the leathern straps being successively taken off as the cording proceeds. Lastly, a mat or piece of sacking is spread under the roots, after they have been well covered on every side with moss and a coating of straw, and its corners are drawn together, and the whole well secured by sewing with twine. The directing label is then sewed or corded on, and the bundle is ready for shipment, fig. 2.

Fig. 1.

Fig. 2

This is the simplest mode of packing a bundle, and answers well for all of moderate size. Usually, however, there are some modifications or additions needed.

If, for instance, there are several sorts of trees and several of a varie-

ty, in the bundle, as usually happens in filling retail orders, it is best to tie up each variety by itself, with a small straw band, and with an admixture of straw among the stems. These are then all placed together on the straps, moss mingled well with the roots, and brought compactly into a bundle, and kept together by a few twisted straw bands. The external coating of straw and cording is applied afterwards.

Very large bundles, are likewise more securely packed by first binding them together, as above mentioned, and strawing them externally afterwards.

Ropes, doubled, so as to form a loop, are sometimes used instead of a strap to draw the bundles together, but they are more apt to cut or bruise the trees, than the flat surface of the leather, or need a thick bed of straw under them. Others employ a windlass for tightening; but this should be used with caution, and with a full supply of straw interspersed among the stems. In the spring of the year, when the buds start and the bark consequently is free, great care should be used to prevent bruising, by a copious use of straw—and all easily broken trees, such as plums, dwarf pears, &c., need special care of this kind.

Fifty trees of common size, seven or eight feet high, will be enough for an ordinary bundle, covered with a mat or sack three by five feet—and two active men will pack in the best manner, about six or eight in a day.

Boxing Trees, should be adopted where they are sent long distances. Although they are heavier, yet as the charge for freight is less upon them for a given weight, they are really of cheaper conveyance. They are also requisite in all instances for seedlings, herbaceous roots, &c.

For trees in large quantities, it is most economical to employ *large* boxes, such as will hold two or three hundred seven feet trees. The size may be about nine or ten feet in length, and over two feet square inside. These, when filled, will weigh about 700 lbs. They should be of boards not more than three-fourths of an inch thick, with battens or cleats across the ends and middle, secured by *wrought* nails, and when the box is filled, they should be banded with hoop iron at the ends. In filling, the trees should be secured to their places occasionally by cross pieces placed within, and nailed at the ends from the outside. These prevent the boxes spreading, keep the tops and bottoms from being crowded off, and hold the trees firmly to their places. The same care as for bundles is needed in mudding the roots, packing in moss, and securing the stems from bruising by an intermixture of straw. A lever, like that for filling flour barrels, may be carefully used for compressing the contents.

For *marking* boxes, a mixture of lamp-black and turpentine is most convenient, as it immediately sinks into the wood and becomes dry at once.

To Preserve Herbs.—All kinds of herbs should be gathered on a dry day, just before, or while in blossom. Tie them in bundles, and suspend them in a dry airy place, with the blossoms downwards. When perfectly dry, wrap the medicinal ones in paper and keep them from the air. Pick off the leaves of those which are to be used in cooking, pound and sift them fine, and keep the powder in bottles, corked up tight.

DOCTORING SICK ANIMALS.

One of the best systems of medical practice ever known, and which will probably stand at the head of the list for all coming time, is NURSING. Good care will do more than all the medicine in the world without it. Medicine is sometimes very good, but the most skilful physicians have found they could do but little with serious cases without that intelligent and careful watching at all times required for the removal or prevention of irritating causes, and known as good nursing.

The writer once owned a horse suffering from an excessive cough. Numerous remedies were prescribed by kind neighbors, enough, doubtless to have killed him at once. It was concluded to discard all, to give the best attention to his wants, and avoid everything which causes or prolongs a cold. This was during the changeable weather of autumn—and he was blanketed whenever a chilly air was apprehended; he was worked very moderately, always avoiding perspiration, and he was fed on succulent food which was supposed to favor expectoration, and especially young clover. In a few weeks nature had performed a perfect cure; and if any one of the nostrums had accidentally been employed, and had not proved very prejudicial, it would unquestionably have received high praise for its efficacy. It is of the utmost importance to discriminate between a recovery *by virtue* of a medicine, and *in spite of it*.

To *keep animals in health*, is more important than to cure sick ones, and for this purpose a few leading rules should be always observed, and which cannot be out of place here.

1. Always feed regularly, as to time and quantity. Many animals are made sick by starving at one time, and stuffing at another. Especially, never *overfeed*.

2. The same rule must be observed with watering—and let the water be *pure*.

3. Never *overwork* an animal—regular and moderate exercise will enable a working animal to do more the year through, by all odds, than any hurried driving at one time and resting and overfeeding at another; and be infinitely less liable to disease.

4. Allow a regular supply of salt—it is useful, but an observance of the preceding rules without salt, will be incomparably better than their infraction with it.

5. Never feed musty or bad food. If musty fodder must be used, pass it through a rapid cutter, and moisten, salt and meal it.

6. Avoid unwholesome or poisonous plants in pastures and in hay.

7. Guard all animals against cold rain and snow falling on them, and against lying on cold wet ground.

8. All changes of food must be *gradual*. If from hay to grass, let the grazing be but an hour the first day, two hours the next, three the next, &c. The same caution must be carefully observed, in beginning to feed with roots, grain, &c.

9. Be careful that animals always have enough of exercise—and plenty of pure, fresh air. Stables must be well ventilated—animals often become sick from breathing foul air.

10. Lastly, and by no means least, let strict cleanliness be observed. All animals, even pigs, kept clean and curried, are found to maintain

their flesh better, or fatten faster, than when dirty and neglected—and cleanliness is more important to health than for flesh.

We do not propose to go into a long discourse on diseases and their remedies, but there are a few of the more common diseases and some simple remedies for them, a knowledge of which may be useful for the inexperienced.

HORSES.

Colic and *inflamation of the Bowels*, are two very common diseases, often confounded together. With colic the pulse is natural, not fifty a minute, the animal often rolls, the disease intermits, and there is usually not much fever. With inflamation, there is much fever, the pulse sometimes rising to nearly a hundred a minute, the attack is gradual, and the disease does not intermit.

The remedies proposed are of the simplest character, and not those often used by professional men.

For Colic—If from badly digested food, give a pint or more of a solution of saleratus; or a mixture of half a pound or upwards of fresh powdered charcoal with thrice its bulk of water, is still safer. Spasmodic colic may be treated with the charcoal internally, and brisk friction externally, and a quart of peppermint tea with a spoonful of powdered cinnamon may be given. Ginger tea is also useful.

For *Inflamation of the Bowels*—This is a difficult disease to cure, and horses generally are killed by the amount of irritating medicines administered, which only add to the disease, such as whiskey, gin and molasses, salts, castor oil, gunpowder, &c. &c. Give a drink of slippery elm every hour, to ally irritation—keep the animal quiet—let him have but little food, and let that be weak gruel. Avoid bleeding.

Scours or *Diarrhœa*—Sometimes this arises from irritating matter, in which case it must not be checked too soon. When it proceeds from exposure after over-exertion, let all the drink the animal takes be slippery-elm water, with occasional doses of a spoonful of charcoal. The food should be dry. Raspberry leaf tea is a good drink, after the symptoms begin to subside. In severe cases, twenty or thirty grains of kino may be given in a quart of thin flour gruel, twice a day.

Cold or *Catarrh*—This is a common and well known disease. Medicines generally are of little use except to allay attending symptoms. Good nursing and careful management are best, avoiding any exciting cause calculated to increase the disease, or retard the gradual cure that nature commonly effects. If followed or accompanied by a hard cough, green food should be given—if in winter, turnips or ruta bagas with warm wet meal are useful. A moderate feeding of fresh apples two or three times a day operates as an expectorant, and relieves the cough.

Heaves—When a horse is fed on musty hay, and his cough begins to assume symptoms of heaves, immediately procure good hay if possible, or else cut the hay fine and always feed it wet, to which add a spoonful of ginger daily until the symptoms disappear. A horse which has the heaves once established, cannot be cured, but the disease may be kept so latent as to be of no inconvenience, by always feeding wet chopped food.

Scratches—(A cutaneous and troublesome disease just above the hoof.) Keep the affected parts clean, by washing with soap and water, and then apply a solution of chloride of lime.

Distemper or *Horse Ail*—(attended with thickened discharges from the nose, and sore throat, often a tumor under the jaws, and weakness.) Rub and curry often to promote warmth and circulation, keep warm and comfortable, and if the animal refuses to eat, withhold all drink, but place before him warm mashes which he will swallow, when he finds his water is not given. He will often eat wet hay, slightly salted, if given him morsel after morsel by the hand. Scraped carrots are excellent. The principal object is to keep up his strength and flesh, until the disease runs its course. A seton is often advisable, diverting the disease.

CATTLE.

If the ten rules already given are carefully observed, cattle will scarcely ever become diseased; and if they do, immediately examine to see if some of these rules are not broken. The following remedies may be applied, in case of a few of the more common diseases.

Horn Ail—The symptoms are dullness, failure of appetite, giddiness, failure of flesh, the horn generally feels cold. The head and not the horn merely is diseased. Boring is generally of no use, and can only give temporary relief where there is a pressure of matter in the horns. Hornless cows have it sometimes. It generally occurs to animals in low condition, with deranged digestive organs. The best remedies are to keep them in a warm shelter, and to give warm, nourishing, and stimulating food. If the animal should happen to be in high condition, feed lightly. Most of the remedies have their reputation because they did not *prevent* natural recovery.

Garget or Caking of the Bag—Let the calf suck, after having drawn off a part of the milk; and if there is danger of matter forming, rub the udder with a liniment of equal parts of goose oil and hot drops. If painful, wash with weak lye. It is very important always afterwards to milk very clean. Avoid high or stimulating food.

Hoven—occasioned by eating too much fresh clover or other green food. The preventive is caution in turning into fresh pastures, allowing but a short time at first. In mild cases, a cure may be effected by a quart of saleratus water; in severe and threatening ones, a penknife must be thrust into the paunch through the skin, two or three inches forward of the hip bone.

Foul in the Foot—caused by standing long in filth—may be cured by removing to a dry clean place, washing with soap, then with chloride of lime, and applying curriers' oil. Washing with salt and water is useful.

Lice—Wash the skin, night and morning, with a decoction of 2 ounces of lobelia seeds in 1 quart of boiling water; after standing 2 hours, apply with a sponge.

Sore Teats—Always wash with *water* before milking, or after calf-sucking—this is often sufficient. If much sore, apply equal parts of lime-water and linseed oil.

Choked Cattle—may be relieved, when the obstruction is high, by thrusting the arm at full length down and seizing it with the fingers. To prevent the animal biting dangerously, pass the arm through a wheel-box or clevis, held firmly in the mouth; or still better, through a wooden box made on purpose, with projecting ends to hold by. If far down the obstruction may be pushed down with a flexible stick with a round soft knob.

To Prevent a Cow sucking herself—thrust a hickory stick, 8 inches long, and half an inch in diameter, through a slit made in the nose, so that the stick may project each way horizontally. If the stick is a little smaller at the center, it will not come out.

Colic, inflammation of the bowels and diarrhœa, require nearly the same treatment as with horses.

SHEEP

Scours—Give 4 ounces raw linseed oil mixed with two ounces of lime-water, when the disease first appears, and give half a gill of ginger tea every four hours, and mix ginger with the food. Feed on gruel or mashes of meal. A drink of slippery elm is valuable. When approaching dysentery, give a teaspoonful of charcoal additionally.

Stretches or Constipation—Give fresh air and exercise, and scalded shorts. Chopped roots are excellent.

For loss of appetite, give camomile tea.

To destroy Ticks, drop on a tincture of lobelia seeds, a few drops only.

Foot Rot—Mix about one part of sulphur with twenty parts of salt, or thereabouts, and feed the sheep regularly with it the season through. In flocks of 2000 sheep, badly infected, it reduced the disease to one thirtieth in a single year, and afterwards entirely eradicated it. Flour sulphur may be bought very cheaply at wholesale in New-York.

Rot—Give 2 ounces powdered charcoal and 1 ounce of ginger, mixed in a pound of oatmeal.

Staggers—if too poorly fed, feed higher; if too high, reduce. Dr. Dadd's remedy is to give half a teaspoonful daily, mixed in food, of slippery elm powder 4 parts, powdered snake-root 2 parts, and 1 part of fennel seed.

As a general medicine, for all diseases affecting the digestive function, a mixture of charcoal and salt is recommended.

SWINE.

Fits—Give a clean, airy pen—feed carefully and *moderately*, with a little horse-radish in the food, and give plentifully of valerian tea.

Measles—usually known by its eruptions, with dullness or drowsiness. Remove to a warm and separate place, keep on thin gruel, give a teaspoonful of sulphur daily, and a drink of bittersweet tea.

Vermin—Mix sulphur and powdered charcoal with the food, and wash the skin in wood-ash lye, and then in a decoction of tobacco.

Diarrhœa—apply the same remedy as for sheep.

PRESENCE OF MIND.

There is no branch of practical education of greater importance than teaching *presence of mind*. Disasters which occur are greatly increased by the fright and perturbation which are generally manifested on such occasions. Self-possession and practical knowledge combined, often give an immense superiority to the person who can command them. The world-felt loss of the steamship Arctic could have been prevented, if a single individual on board had possessed these two qualities:—by immediately driving the water from one boiler, and filling the other, the rent

in the ship's side would have risen above the water's edge, and the hundreds who perished been saved.

Fright and confusion often result directly from conscious ignorance, and a feeling of inability to help one's self. Hence it is of the utmost importance to fix clearly and indelibly in the mind at all times what course should be pursued when accidents occur. The remedy may be then instantly applied. A volume should be written to teach this knowledge, which should be taught in schools and colleges, as equally important with arithmetic, chemistry, and book-keeping. As an illustration of our meaning, and also as a small contribution to this object, we furnish a few rules to be observed in certain cases of emergency or of accident.

If a house takes fire, instantly endeavor *to keep all the doors shut*. Currents of air and of flame cannot pass through, and it will burn much more slowly, and furniture may be saved, and perhaps the conflagration so retarded until it may be extinguished. We have known houses in a mass of flames in a few minutes, merely in consequence of doors left wide open in the fright and terror of the occasion.

If the lower story is in flames, and inmates are above, the first thing is to direct the attention to loosening a bed cord or tying bed clothes together, which, fastened to the bedstead, will admit a safe descent. A prompt attention to this particular would often save broken limbs, from leaping.

If horses become frightened and run, in all cases *keep your seats*, unless they stop so that you may jump out safely. A passenger striking the ground or any obstacle, alone and unprotected, is far more likely to be injured, than when encased in the protecting walls of a carriage. Always avoid the extreme folly of seizing the reins from the driver.

If harness breaks while ascending a hill in a wagon, instantly turn the horses' heads from the bank or precipice if there be any. This will cause the wheels, in backing, to turn to the same side, and prevent falling or running off. The same precaution is to be observed, if a balky horse should commence backing.

Horses which run away and cannot be stopped, may be checked (and sometimes cured,) if a long ascent is at hand, by turning them up the hill. They soon get tired of this kind of hard work, and if then urged still upward, will be reluctant to run away again.

To save horses from a rapidly burning barn, they must be instantly blindfolded. They cannot otherwise be led out.

In assisting persons who have broke through ice,—procure, if possible, a pole or stick—laid horizontally on the ice, it will sustain a considerable weight, even if the ice is thin, and also assist in laying hold for extrication. Many persons lose their lives in water, by slipping off the ice edge while attempting to raise themselves on their arms. It is better to approach the edge *sidewise*, and attempt to *roll out*.

In case of a severe wound, and danger of bleeding to death, before medical assistance arrives, immediately tie a knot in the middle of a pocket handkerchief—(or if one is not to be had, use a suspender)—then tie the handkerchief loosely around the part cut, *betweem* the cut and the *body* placing the *knot* about a couple of inches from the wound; put in a short stick through the bandage and *twist* until the blood stops running. Bleeding to death may almost always be prevented in this way.

In resuscitating persons who have been drowned—place them upon a table or bed with the head a little elevated; procure a pair of bellows if possible—place the nose in the mouth of the patient, close the rest of the mouth with a cloth, and forcibly fill the lungs. Then remove the bellows, press upon the lungs, and drive out the air. Repeat the operation as rapidly and thoroughly as possible for several hours—meanwhile keep the body and extremities warm by hot flannels and rubbing. If no bellows can be had, let the strongest person present inflate his lungs to their full capacity, immediately place his mouth on that of the patient, force the air into his lungs—imitate natural breathing as far as possible. The reason why a person dies from drowning is that the supply of air is cut off from entering the lungs—*no water* by any possibility ever enters them, so by giving the lungs a copious supply of fresh air and inducing circulation by friction and warmth, we are doing all that can be done to restore the patient.

In cases of poisoning, if discovered immediately, take a thorough emetic at once. Many things will answer if no better can be found—a dessert spoonful of mustard in a gill or less of warm water, or 3 or 4 grains of tobacco, (a small quid) will operate as a ready emetic.

PROPAGATING BY CUTTINGS.

Nothing is more easy and simple than to raise plants of the willow or gooseberry by cuttings, a practice which has been long known, when applied to such easy-rooting sorts as these, which, however, comprise a very small part of the vegetable kiugdom. It is only of late years that the art has become so thoroughly perfected that nearly everything of vegetable growth may be increased by cuttings. When applied to the more difficult species, as, for example, the resinous trees, it becomes one of the most delicate and skilfull of all gardening operations. It is however merely intended here to speak of the simpler and easier processes, and such as may be performed without the assistance of a *propagating* house.

Fig. 1.

Fig. 2.

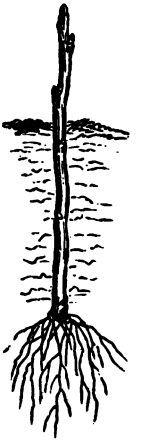


Fig. 3.

When an easy-rooting cutting is placed in earth, the descent of its sap in the bark, being arrested at the cut, forms a *callus* or ring round the face of the cut (Fig. 1,) which soon swells and shoots down into the soil in the form of roots, (Fig. 2,) forming, as growth proceeds, the new plant or tree, as in fig. 3, which represents the rooted cutting of a currant; no care being required in its management but simply removing the shoot at its base sometime during autumn or winter, preserving it in mould, and

planting to two-thirds its length early in spring. Perhaps the easiest and simplest of all is the peg-cutting, (Fig. 4,) used for multiplying oziers, &c., and which consists merely of a branch cut to a certain length, sharpened, and driven into a hole previously made with a bar or stake. These cuttings may be made of portions of the trunk of considerable size, (Fig. 5,) and are often seen growing into trees, where willow stakes have been driven into moist soils for other purposes.

Fig. 4.

Quinces, grapes, &c., often root freely from cuttings planted in the open ground, provided the soil is deep, rich and mellow, —deep to retain moisture; rich to impart vigor; and mellow, to fit closely the surface of the shoot, and prevent drying. The character of the soil is of the greatest consequence, for if it be too heavy, cold, or compact, the cuttings will decay; and if too loose, they will dry up. As a general rule, a soil just light enough never to crack by drying, and warm and mellow, will be best for currants, gooseberries, grapes, quinces, climbing roses, bush honeysuckles, &c. Those inclining in the least degree to be tender, should be cut in autumn, as their vigor is often seriously injured by exposure to intense cold, even when they are not killed. Out-door cuttings, like the above, should be buried, with the earth pressed closely about them, so as to leave but one or two buds above ground, and only one for the grape. If long, they should be set sloping, approaching horizontal, to receive surface heat.

Fig. 5.

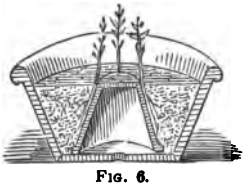


Fig. 6.

If the season should be very dry, the soil may be kept moist by a mulching of sawdust, tan, or forest leaves, or by systematic irrigation,—if on a small scale, by the watering-pot, or if on a large scale, by the water-cart, or channels, which, to prevent baking the surface, must be on a mulch. For the dwarf or tree-box, or any other easily rooting evergreen, a shading for the whole plant is indispensable, and may be effected by a low awning covered with mats or straw, or by lines of inclined boards, each line shading a row of cuttings. Cuttings which will not strike root with the preceding management, may in many instances be made to succeed by simply covering them with a bell-glass, to prevent the escape of moisture, and preserve a humid and still atmosphere for them, or by placing them in a partly spent hot-bed, or in a coal-pit under a glass sash. This is a very common me-

Fig. 7.

thod of treating the cuttings of roses, pelargoniums, and other plants, which are taken from the plants while growing, and on which a part of the leaves are left to keep up active growth till the roots are formed.

It is a well known but curious circumstance, that many sorts of trees, if inserted merely in a mass of earth, will not root at all, or but very rarely, while if placed in contact with the sides of the pots they seldom fail to become rooted plants. An English cultivator, some years ago, had long tried to strike cuttings of orange trees without success, when hearing of this practice, he was enabled, on the first trial to raise eleven out of thirteen. Fig. 6 represents a propagating pot for this purpose, the hole at the bottom being covered by an inverted smaller pot, against the sides of which the cuttings are placed, the hot air passing up through the hole, and imparting heat to the smaller pot and plants. The central pot also serves to keep the new plants apart, so that they are easily separated afterwards. Large bell-glasses, (Fig. 7,) are sometimes conveniently used to cover a great many small pots at one operation, where great nicety of process is not required as in China roses; where much skill is required, single glasses, nearly fitting the dimensions of the cuttings, are found to succeed best (Figs. 8 and 9.) Several small cuttings, as of heaths, for example, may be placed under a broad low glass, (Fig. 10.)

FIG. 8.

FIG. 9.

FIG. 10.

SATISFACTORY FARMING.

The *Country Gentleman* gives the following interesting account of the great success which has attended a thorough system of farming in connection with regular underdraining, as conducted by JOHN JOHNSTON and R. S. SWAN, near Geneva, N. Y.

"If any are dubious as to the profitableness of expending $30 per acre in underdrains, let them visit the farms of JOHN JOHNSTON and ROBERT S. SWAN near Geneva, N. Y. After gazing at corn, yellow and stunted, as are most of the fields we pass on the N. Y. Central Railroad, it is delightful to walk through an eighteen acre field of Dutton corn gaily waving its tassels a yard above one's head. Such a field has Mr. JOHNSTON. Standing on the side of the hills we could not reach the top of the tassels within eighteen inches. We have never seen such a piece of corn before in this state; the whole field is the same, except a few rods where an underdrain is stopped, and here the corn is *not one quarter as good*. We may say, *par parenthese*, that Mr. J. has laid 210,000 tiles on his farm, and this is only the second drain that has been stopped.

When Mr. JOHNSTON bought what was then called the "poorest farm in all creation," one of his neighbors said that he "would starve" on it; but by underdraining, by growing clover, and consuming it on the farm by sheep and cattle, and by using a large quantity of oilcake as food for stock, by a judicious rotation, deep plowing and thorough cultivation,

he has made it one of the most productive farms in the state. Agriculture is a complex art. We must not attribute this great improvement to underdraining alone, but it lies at the foundation; the deep plowing, thorough cultivation and high manuring would have had comparatively little effect without it.

The prominent points of Mr. JOHNSTON's system are as follows: 1. Feeding a large number of cattle or sheep in winter. For instance, late last fall he purchased 881 Spanish Merino sheep for $600, and fed them during the winter on wheat and oat straw, and half a pound of oilcake and three-fifths of a pound of corn per sheep per day. He sold them in the spring at $6 per head. The cost of oilcake and corn was $1.68 per sheep. 2. The rich manure made from the oilcake and corn-fed animals is applied to the land *in the fall*; generally it is spread on a grass field that is to be plowed the following spring and planted with corn. 3. Clover is not plowed under as a manure. The wheat is seeded down in the spring with 8¼ lbs. of clover and 5 quarts of Timothy. It is allowed to lie in grass four years, being generally mown for hay. 4. Eight tons of plaster are used on the farm each year. It is sown *broadcast*, a bushel per acre, on the corn at or immediately after planting, and the clover and grass lots are supplied freely. It is, too, sown on the wheat in the fall for the benefit of the young clover next year. 5. Salt is frequently sown, a barrel per acre on the wheat. It gives a bright, stiff straw, and causes the wheat to *ripen earlier*. Salt too is often sown on the corn and hastens its maturity. 6. For wheat the land is usually summer fallowed, but now since the soil is so rich that the wheat is sometimes too rank, an occasional oat or barley crop precedes it. There are many other interesting points in Mr. JOHNSTON's management to which our space forbids allusion this week.

The farm of Mr. SWAN deserves more extended examination than we were able to give it. Mr. S. studied agriculture with Mr. JOHNSTON, and brought intelligence, skill, great energy, practical knowledge and abundant capital to the work of improving a beautifully located farm of 340 acres, but which had been "run out" by mismanagement and neglect. Four years since, when he came in possession, the wheat on the farm produced only five bushels per acre, and some of it was plowed under in the spring. He commenced a systematic course of drainage, and has prosecuted the work with such energy, that he has not a field on this large farm which is not thoroughly underdrained. We have never seen a farm in Great Britain where the drainage was more complete, *and none where there were so few ditches*. He has laid *forty-six miles* of underdrains. The result is most satisfactory and astonishing. On one field, where four years since the wheat yielded less than five bushels per acre, there was growing at the time of our visit a crop that we should estimate at 30 bushels per acre. The corn and oats too are most excellent.

DRYING WOOD.—It has been found that the most thoroughly seasoned wood, at common temperatures, still contains about one-tenth water.

STINGS OF INSECTS are accompanied by an *acid* poison. One of the best remedies, as we have fully proved, is a paste made of saleratus and water. A paste of fresh ashes would be good. It neutralizes the poison.

THE GREAT TREE.

A late number of the *Horticulturist* contains some interesting information in relation to the *Sequoia gigantea*, which the English botanists are determined to call the *Wellingtonia*, and which some of the Americans are as pertinaciously resolved shall be known as *Washingtonia*.

The information we allude to, is contained in an article originally from the *California Farmer*, a communication from Dr. F. Winslow, an American traveller. We have already furnished our readers a brief account of this magnificent giant, and the testimony is ample in proof of its vast dimensions; but the following extract from Dr. Winslow's communication, at the same time that it is graphic and precise, gives the height rather greater than other accounts that we have met with:—

"The *Great Tree*, (thus he distinguishes the *Sequoia gigantea*,) is peculiar to the Sierra Nevada, and grows no where else on the globe. I may even add, as far as my information extends, that it is entirely confined to a narrow basin of 200 acres at most, of which the soil is silecious and strewn with blocks of Lignite. This basin is very damp, and retains here and there pools of water; some of the largest of the trees extend their roots directly into the stagnant water, or into the brooks. There are more than a hundred which may be considered as having reached the extreme limits of growth which the species can attain. One of our countrymen, Mr. Blake, measured one, of which the trunk, immediately above the root, was 94 feet in circumference. Another, which had fallen from old age, or had been uprooted by a tempest, was lying near it, of which the length from the roots to the top of the branches was 450 feet. A great portion of this *monster* still exists, and according to Mr. Lapham, the proprietor of the locality, (and who has undoubtedly appropriated to himself all trees by right of occupation,) at 350 feet

from the roots the trunk measured 10 feet in diameter. By its fall, this tree has overthrown another not less colossal, since at the origin of the roots it is 40 feet in diameter. This one, which appeared to me one of the greatest wonders of the forest, and compared with which man is but an imperceptible pigmy, has been hollowed, by means of fire, throughout a considerable portion of its length, so as to form an immense wooden tube of a single piece. Its size may be imagined when it it is known that one of my companions, two years ago, rode on horseback in the interior of this tree for a distance of 200 feet, without any inconvenience. My companions and myself have frequently entered this tunnel and progressed some sixty paces, but have been arrested before reaching the end by masses of wood which had fallen from the ceiling. Near these overthrown giants others still are standing, not inferior to them in size, and of which the height astonishes the beholder. I can mention three particularly, which, entirely isolated. grow near each other so systematically as to appear to have been planted purposely to produce the effect. A fourth is remarkable in having, between fifty and one hundred feet from the ground, its trunk divided into three enormous branches of the same size and nearly parallel, extending to a distance of more than 800 feet. Others are distinguished by the straightness of their trunk, comparatively as delicate and erect as that of a Pine-tree, and which are not less than 850 feet in height. At some distance may be seen a species of knoll rising from the surface of the ground, and which is merely a half developed knot, the last remains of one of these monsters, which have fallen centuries ago, and are now buried under the soil.

"I am informed by Mr. Lapham, that the wood of one of these trees is remarkable for its very slow decomposition. When freshly cut the fibre is white; but it soon becomes reddish, and by long exposure to the air acquires a color nearly as dark as Mahogany. Its consistence is rather feeble, and nearly resembling the Pine or Cedar, but the bark covering it differs materially from the latter. It is excessively thick near the foot of the tree, sensibly elastic on pressure, and is readily divided into a small mass of fibres closely resembling those constituting the husk of the cocoa-nut, but much finer. About this portion of the trunk it is split in every direction by deep cracks, but at the elevation of 100 or 180 feet, it is almost smooth and not more than two inches in thickness. At this point the bark is removed from the living tree for exportation. (How can such a sacrilege be tolerated!) A hotel has been built along side of the "Great Tree," the bark of which was exhibited last year at San Francisco, and, on its overturned trunk a sort of ladies' pavilion has been erected, which serves as an elegant promenade. In order to fell it the trunk was bored, by means of a very long and powerful augur, with many holes very near to each other and arranged circularly; but even when almost detached from its bases its immense mass resisted all efforts to overthrow it. Four days subsequently it was blown down by the wind. It shook the earth when it fell, and made for itself a deep furrow in the ground in which it lies, at this moment, half buried."

Now to read simply of a tree four hundred and fifty feet high, we are struck with large figures, but we can hardly appreciate the height without some comparison. Such a one as that through which the horseback journey was performed, would stretch across a field twenty-seven rods wide; if standing in the Niagara chasm at Suspension Bridge, it

through the earth. *Baked* wood is nearly as perfect a non-conductor as glass; and when a foot in length and compared with glass of only half an inch, would insulate incomparably the best. Every electrician is aware that the heaviest discharge from a Leyden jar may pass safely through a metal rod held in the bare hand, provided the communication is complete at each end of the rod,—which being so much a better conductor than the hand, none of the fluid passes into the latter. In the same way, a good lightning rod, high above the building, and entering the earth deeply, will carry down a heavy discharge through even thoroughly moistened supports, without any tendency to pass into the building. An interesting proof of this fact occurred some years ago, at a house formerly occupied by the writer. The rod, an inch in diameter, was a single silvered point at the top, and entered the earth six feet, into a bed of charcoal deposited there. During a severe thunderstorm, an explosion occurred to which the discharge of a cannon seemed as a mere pop-gun, and the building trembled to its foundations. It was however found to be uninjured; but the next day the point of the rod with its cap of silver, was found melted into a ball, nearly as large as a rifle bullet! This rod was held about one foot from the clapboarding by means of wooden supporters, painted like the rest of the house; and but for its protection, in carrying down, as it evidently did, a tremendous discharge of lightning, the dwelling would probably have been shivered to fragments.

MICE-GNAWED TREES.

The remedy of connecting the upper and lower portions of the bark of fruit trees separated by the gnawing of mice, has been known, published and practiced for many years, although recently described in some of the papers as new. We have, however, recently witnessed a mode of applying this remedy adopted by S. M. Woodruff, of Canandaigua, N. Y., which is so simple, easy and efficient, that we think it worthy of being placed before our readers for future use. About seventy of his fine young bearing trees had been completely girdled, some of them for the length of nearly a foot, and this remedy has saved nearly all of them.

A number of young shoots or portions of the branches of apple trees are first provided, and as they are wanted, are sharpened in the form of a wedge at each end, being long enough to connect the upper and lower portions of the bark, separated by gnawing. A chisel, the breadth of which is about equal to the diameter of the shoots, is then driven into the bark, (say half an inch from the gnawed edge,) both above and below, and the prepared or sharpened shoot is then firmly pressed at each end into the cut made by the chisel. This is easily done by first bending the shoot outwards at the middle, so as to allow each end to enter, and then crowding it in again. The place must be then well waxed. The *edge* of the chisel must be placed so as to make a horizontal line in the bark, and then be driven nearly verti-

Fig. 1.

Fig. 2.

cally upwards or downwards for the upper or lower parts of the bark. When the shoot is placed in the cut thus made, some portions of the line between the bark and the wood in both tree and shoot, must necessarily coincide, and as a consequence, the two parts almost invariably adhere and grow together—there is scarcely ever a failure. Fig. 1, represents a girdled tree; Fig. 2, the same with the shoots inserted; and Fig. 3, is an enlarged section, showing the position of the sharpened end of the shoot when in its place. The great advantage of this mode consists in the rapidity with which the work may be done, and the difficulty of displacing or knocking out these shoots when once in. There should always be a few stout stakes driven around each tree, to keep off plows, harrows or cultivators, which might otherwise strike the tree and loosen these shoots.

Fig. 3.

The shoots used were about one-fourth to one-half an inch in diameter when applied, and they had already tripled their original size. Probably larger ones would be better, and the more numerous they are the greater will be the security, and the sooner they will grow and unite in one solid trunk.

APPARATUS FOR SHEARING SHEEP.

An Ohio correspondent of the *Country Gentleman*, furnishes that paper with the following:—Not having seen any notice of any improvement on the old-fashioned mode of shearing sheep,—no doubt as uncomfortable for the sheep as the shearer—I thought I would send you a sketch of one I have been using for the last three years, which I find

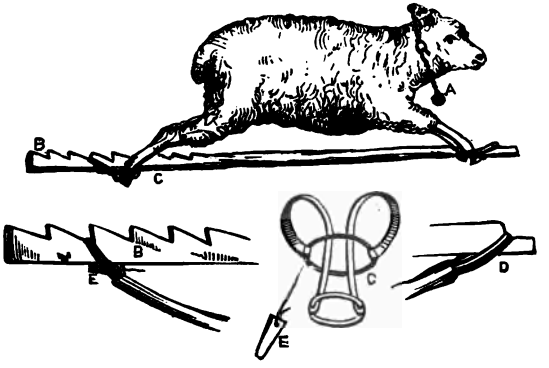


Fig. 1.

to be just the thing. It was first made and used by a neighbor who has followed shearing many years. It has these advantages,—the shearer stands up to his work, having both hands free; the sheep cannot injure

itself by struggling, even if heavy with lamb, and you can shear faster and easier.

Description.—A. Small rope, with iron ring in the end, passes through two holes in the table, and over the sheep's head.

B. Hickory stick, 7 feet long, 2 inches wide at the notched end, notches 1½ or 2 inches apart, for adapting it to the size of the sheep.

C. Shackles, made of two leathern straps, one inch wide, fastened to each end of a small iron ring, 1½ or 2 inches diameter, and passing and fastened to another ring 2 inches in diameter.

D. Forward end of stick B.

E. Wooden wedge, to fasten rings on the notched stick.

Mode of operation.—The sheep is caught, turned on its haunches, and the under part of neck and between the fore legs are sheared; then lifted on the table or bench, the head placed under the rope, the leather shackles put on the feet, and stick inserted—as shown in the cut; one side is sheared and then the sheep is turned over, and finished. Hoping this may benefit some of my brother farmers, I submit it to your consideration.

[It strikes us that any assistance in performing the laborious and disagreeable work of shearing sheep will be especially acceptable to the far-

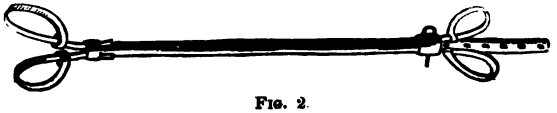


Fig. 2.

mer, and we gladly give place to the above. A friend suggests an improvement, shown in Fig. 2, representing two leathern loops at each end of a stick, through which the feet are inserted; and as the legs are extended these loops draw tight and hold the sheep fast. A sliding ring, with a pin and holes, accommodates it to the size of the sheep. Two leather straps (not shown,) nailed to the table, and connected by a buckle in the middle, then receive the neck of the sheep, as in the mode described by our correspondent.]

PAINTS AND WHITEWASH FOR BARNS, &c.

The following mixtures are given in Wheeler's new and useful work, entitled "Homes for the People," from which some valuable hints may be derived in forming desirable tints:—

A cool grey, similar to what would be the tint of unpainted timber after a few years, may be obtained as follows:

Indian Red, half a pound;
Lamp Black, three ounces;
Raw Umber, half a pound, mixed with one hundred pounds of White Lead.

This color will be changed by the addition of sand, which in all cases is recommended, in a proportion of about one quart to every one hundred pounds of mixed color. The finest and whitest sand that the neighborhood affords should be used, and as its hue differs so will the tint of the paint be changed.

This color with one-third less white, is very suitable for roofs, and is a cool, unreflecting grey tint of great softness and beauty.

Cream color, No. 1.—A soft pleasant tint like that of coffee greatly diluted with milk, is oftentimes well adapted to a building, particularly in regions where red sand stone or other similar objects, with such local coloring, give a brown hue to portions of the landscape.

It may be mixed as follows:

Yellow Ochre, five pounds;
Burnt Umber, half a pound;
Indian Red, quarter of a pound;
Chrome Yellow, No. 1, half a pound, with one hundred pounds of White Lead.

The key notes in this color are the Indian Red and the Chrome Yellow, and the tone may be brightened or lowered by more or less of either, as individual taste may prefer.

No. 2.—A still more delicate tint, resembling the pure color of the Caen stone, and well adapted for a large building with many beaks of outlines, may be mixed thus:

Yellow Ochre, two pounds;
Vandyke Brown, quarter of a pound;
Indian Red, quarter of a pound;
Chrome Yellow, No. 1, half a pound to every one hundred pounds of Lead.

Downing in "The Horticulturist," says:—

As this is the season of the year when considerable whitewashing is performed, and as we have been inquired of for a good whitewashing receipt by numbers of new subscribers who have not read our receipt in a former volume, we present it again, knowing that a good story is never the worse to be twice told:—

Take a clean barrel that will hold water. Put into it half a bushel of quicklime, and slack it by pouring over it boiling water sufficient to cover it four or five inches deep, and stirring it until slacked. When quite slacked dissolve it in water, and add two pounds of sulphate of zinc, and one of common salt, which may be had at any of the druggists, and which in a few days will cause the whitewash to harden on the woodwork. Add sufficient water to bring it to the consistency of thick whitewash.

To make the above wash of a pleasant cream color, add 8 lbs. yellow ochre.

For fawn color, add 4 lbs. umber, 1 lb. Indian red, and 1 lb. lampblack.

For grey or stone color, add 4 lbs. raw umber, and 2 lbs. lampblack.

The color may be put on with a common whitewash brush, and will be found much more durable than common whitewash.

The Locust Tree has grown, in forty years, sixty feet high, and six feet in circumference at a height of 8 feet from the ground. The wood toughens as the tree grows older.

would tower two hundred feet above the top of the bridge; if placed in Broadway, New-York at the head of Wall street, it would overtop Trinity steeple by one hundred and sixty feet, and would be two hundred and thirty feet higher than Bunker-Hill monument, Boston; or two hundred and seventy above Washington monument, Baltimore. If cut up for fuel, it would make at least *three thousand cords*, or as much as would be yielded by sixty acres of good woodland. If sawed into inch boards, it would yield about three million feet, and furnish enough three inch plank for thirty miles of plank road. This will do for the product of one little seed, less in size than a grain of wheat.

By counting the annual rings it appears that some of the oldest specimens have attained an age of three thousand years. If this computation is correct, and we see no reason to doubt it, they must have been as large as our best forest trees in New-York, in the times of Homer and the prophet Elijah; and venerable and towering giants during the Carthagenian wars. In other words, "The Roman Empire has begun and ended" since they commenced growing. We hope the small plantation which comprises their whole number, will not share the fate of the world-renowned cedars of Lebanon on their native mountains, now reduced to a dozen in number, but that they will be protected and preserved, and only those that fall by old age be removed for exhibition. It would of course be idle to talk of transporting such a monster to this part of the country, weighing as it does some five thousand tons, and a portion of its shell only may be secured as a fragment of such a specimen in natural history.

The figures at the head of this article represent the relative size of the gigantic Sequoia, and of the largest forest trees in the more fertile districts of New-York, where elms and maples attain a height of 90 feet, and pines 180 feet.

TO PREVENT WHEAT FROM SPROUTING.

To give a remedy after the damage is done, may remind our readers of the old proverb, "after the steed is stolen, shut the stable door." But as a shrewd old friend sometimes remarks, "the best way is as good as any,"—a practice which will insure the grain crop from injury in wet seasons, and be wholly unobjectionable at other times, is worthy of adoption.

We have taken some pains to ascertain by experiment the precise time of cutting when the wheat crop affords the largest yield; and this we find to be when the chaff has become about one-half or two-thirds yellow, green streaks running through it—a few days earlier is better than too late. We have recommended this practice to our readers, and also to our neighbors, and many have adopted it. A good farmer and careful observer informs us that he cut a part of his wheat this

year while in this condition, and put it up in capped shocks, well known to many farmers, and represented in the annexed figure. It remained during the long period of heavy rains which followed, dried thoroughly during this time, and came out as bright and as fresh as in any year; while all the rest, cut at the usual time, was badly sprouted. The contrast was remarkable.

We saw large fields the present year that were quite ripe enough to cut, before the rains commenced, and regretted, at the time the risk from delay that the owners were incurring, but did not dream of so disastrous a result.

Now if the practice of cutting early and shocking securely, is as good in any season, and better in wet ones, why not adopt it generally? Let our readers make a memorandum of this matter in their minds, for another year.

SUPPORTS FOR LIGHTNING RODS.

Nearly all the directions that occasionally appear for the erection of lightning rods, require that a glass insulating ring be placed around the rod at each point of support, to prevent the electric fluid from passing to the building. Most of the rods we have seen have this contrivance carefully attached to them, and in most instances the ring was placed inside a hole through an iron rod or bolt, the other end of which entered the timbers of the building.

Now, there are but two objections to this contrivance, namely, that first, it is of no use; and secondly, it misleads to security by causing neglect of other precautions—all for the following reasons:—

1. The distance insulated is too small to be of any practical utility, for very small charges of the fluid, such for instance as may be obtained every successive second from any good electric machine, will leap through the air a greater distance than that from the rod to the iron support; consequently in the heavy explosions from the clouds, it would be perfectly inefficacions.

2. The glass, by becoming wet, as it certainly would in any thunder storm, would immediately become a conductor, and if useful at any other time, would now lose all its valuable property.

3. The nearness of the rod to the iron support, would tend to turn the fluid into the building, if the communication to the earth below should happen to be imperfect, or if the explosion were too large to be easily carried down by the rod.

A much better plan is to make supports of wood, which may be of plank or small scantling, with a hole bored through one end for the passage of the rod, the other to be screwed, nailed, or mortised into the building, so as to hold the rod off at least one foot distance from the outer side wall. If the rod is sharp at the upper end, high enough above the roof, continuous throughout, and enters the earth several feet (at least 6 or 7,) so as to reach permanently moist earth, no danger can ever arise—because the electric fluid always takes the *best conductor*, and as iron conducts almost infinitely better than seasoned wood, and the rod is held by it at some distance from the building, the discharge would pass instantly into the moist subsoil and be as instantaneously dissipated

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planting to two-thirds its length early in spring. Perhaps the easiest and simplest of all is the peg-cutting, (Fig. 4,) used for multiplying oziers, &c., and which consists merely of a branch cut to a certain length, sharpened, and driven into a hole previously made with a bar or stake. These cuttings may be made of portions of the trunk of considerable size, (Fig. 5,) and are often seen growing into trees, where willow stakes have been driven into moist soils for other purposes.

Fig. 4.

Quinces, grapes, &c., often root freely from cuttings planted in the open ground, provided the soil is deep, rich and mellow, —deep to retain moisture; rich to impart vigor; and mellow, to fit closely the surface of the shoot, and prevent drying. The character of the soil is of the greatest consequence, for if it be too heavy, cold, or compact, the cuttings will decay; and if too loose, they will dry up. As a general rule, a soil just light enough never to crack by drying, and warm and mellow, will be best for currants, gooseberries, grapes, quinces, climbing roses, bush honeysuckles, &c. Those inclining in the least degree to be tender, should be cut in autumn, as their vigor is often seriously injured by exposure to intense cold, even when they are not killed. Out-door cuttings, like the above, should be buried, with the earth pressed closely about them, so as to leave but one or two buds above ground, and only one for the grape. If long, they should be set sloping, approaching horizontal, to receive surface heat.

Fig. 5.

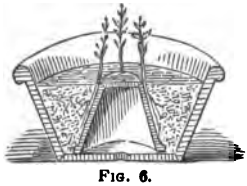

Fig. 6.

If the season should be very dry, the soil may be kept moist by a mulching of sawdust, tan, or forest leaves, or by systematic irrigation,—if on a small scale, by the watering-pot, or if on a large scale, by the water-cart, or channels, which, to prevent baking the surface, must be on a mulch. For the dwarf or tree-box, or any other easily rooting evergreen, a shading for the whole plant is indispensable, and may be effected by a low awning covered with mats or straw, or by lines of inclined boards, each line shading a row of cuttings. Cuttings which will not strike root with the preceding management, may in many instances be made to succeed by simply covering them with a bell-glass, to prevent the escape of moisture, and preserve a humid and still atmosphere for them, or by placing them in a partly spent hot-bed, or in a coal-pit under a glass sash. This is a very common me-

Fig. 7.

thod of treating the cuttings of roses, pelargoniums, and other plants, which are taken from the plants while growing, and on which a part of the leaves are left to keep up active growth till the roots are formed.

It is a well known but curious circumstance, that many sorts of trees, if inserted merely in a mass of earth, will not root at all, or but very rarely, while if placed in contact with the sides of the pots they seldom fail to become rooted plants. An English cultivator, some years ago, had long tried to strike cuttings of orange trees without success, when hearing of this practice, he was enabled, on the first trial to raise eleven out of thirteen. Fig. 6 represents a propagating pot for this purpose, the hole at the bottom being covered by an inverted smaller pot, against the sides of which the cuttings are placed, the hot air passing up through the hole, and imparting heat to the smaller pot and plants. The central pot also serves to keep the new plants apart, so that they are easily separated afterwards. Large bell-glasses, (Fig. 7,) are sometimes conveniently used to cover a great many small pots at one operation, where great nicety of process is not required as in China roses; where much skill is required, single glasses, nearly fitting the dimensions of the cuttings, are found to succeed best (Figs. 8 and 9.) Several small cuttings, as of heaths, for example, may be placed under a broad low glass, (Fig. 10.)

Fig. 8.

Fig. 9.

Fig. 10.

SATISFACTORY FARMING.

The *Country Gentleman* gives the following interesting account of the great success which has attended a thorough system of farming in connection with regular underdraining, as conducted by John Johnston and R. S. Swan, near Geneva, N. Y.

"If any are dubious as to the profitableness of expending $30 per acre in underdrains, let them visit the farms of John Johnston and Robert S. Swan near Geneva, N. Y. After gazing at corn, yellow and stunted, as are most of the fields we pass on the N. Y. Central Railroad, it is delightful to walk through an eighteen acre field of Dutton corn gaily waving its tassels a yard above one's head. Such a field has Mr. Johnston. Standing on the side of the hills we could not reach the top of the tassels within eighteen inches. We have never seen such a piece of corn before in this state; the whole field is the same, except a few rods where an underdrain is stopped, and here the corn is *not one quarter as good*. We may say, *par parenthese*, that Mr. J. has laid 210,000 tiles on his farm, and this is only the second drain that has been stopped.

When Mr. Johnston bought what was then called the "poorest farm in all creation," one of his neighbors said that he "would starve" on it; but by underdraining, by growing clover, and consuming it on the farm by sheep and cattle, and by using a large quantity of oilcake as food for stock, by a judicious rotation, deep plowing and thorough cultivation,

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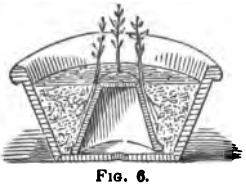

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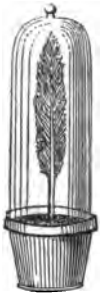

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